Food Boom in 1961 p. 31
Plant Waste Campaign p. 37
Poly-Coated Milk Cartons p. 42

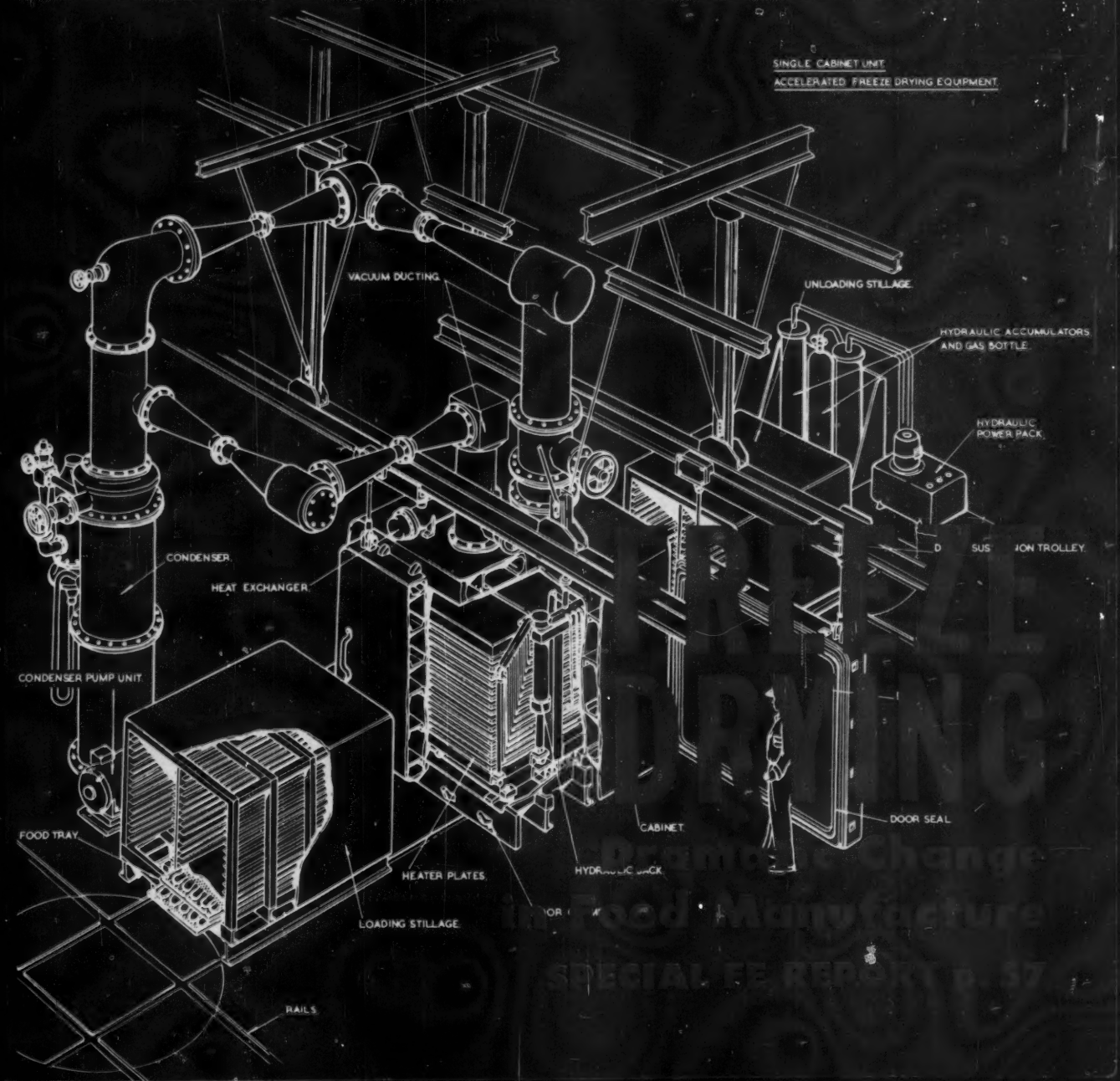
DECEMBER 1960

$1.00

FOOD ENGINEERING

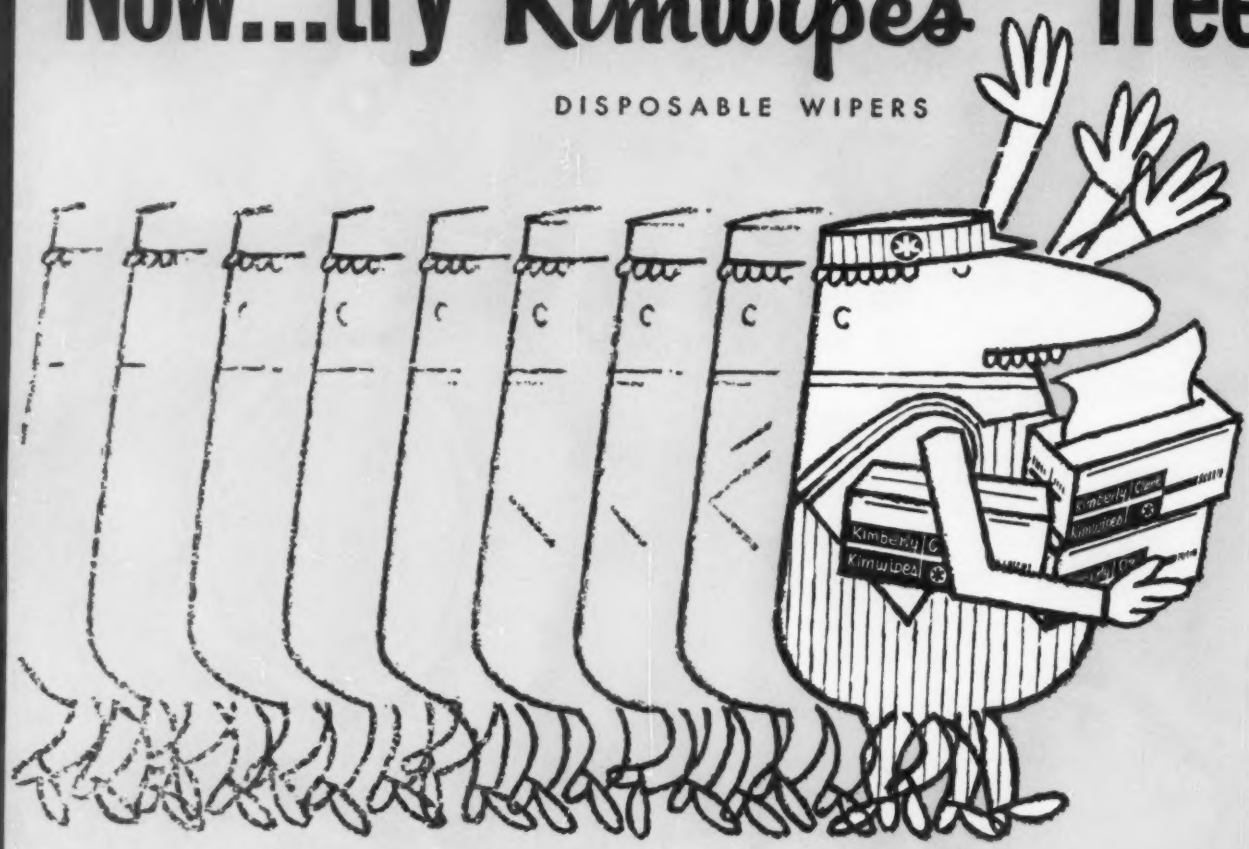
BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A CHILTON PUBLICATION



Now...try Kimwipes® free!

DISPOSABLE WIPERS



Mail the coupon *today* so that we can rush you your FREE box of 100 Kimwipes disposable wipers. Try Kimwipes in your plant to prove to your own satisfaction that they perform better than cloth towels in food processing operations.

Use Kimwipes for quick, thorough absorption of shortening oils and grease. Use them *wet* for easy removal of sticky frosting, syrups, sugar and flour from workers' hands and machinery. Use both *wet* and *dry* for keeping equipment clean and sanitary. Available in handy pop-up packages or metal wall dispensers.

Super-sanitary Kimwipes pay for themselves in savings on towel laundering, alone!

Kimberly-Clark Corporation
Dept. No. FE-120
Neenah, Wisconsin

Fill in this coupon, and mail it, today!

Please send me my FREE package of Kimwipes disposable wipers, "900-L."

NAME_____

FIRM NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

By the makers of KLEENEX® tissues...

Kimberly-Clark

PRODUCTS

FOOD ENGINEERING

BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A CHILTON PUBLICATION
VOL. 32 NO. 12

December, 1960

EVERY MONTH FEATURES

Trends & Forecasts ...	7
Schedule of Events	9
Hors d'Oeuvres	9
Developments to Watch	13
Who's Building What...	17
Washington Report ...	21
Packages & Products..	24
Opinion	29
Practical Ideas	51
Marketing Signals	67
Advances in Technology	77
Men & Companies	91

SERVICE CENTER

Equipment & Supplies..	97
Just Off the Press.....	112
Useful New Books	120
Recent Inventions	122
Classified Advertising .	124
Advertisers' Index	127
Advertisers' Literature & Reader Service ... Back of Issue	

1961 Food Boom Rolls On 31
Industry to gain no matter how economy goes.

Schools Keep Pepsi Bottlers 'In the Know' 34
Training program educates Pepsi-Cola dealers in new techniques.

Reduce Plant Waste by Campaign 37
Promotion of concentrated campaign effects waste-control.

Nitrogen Gases Stop Flavor Fade 41
They sparge harmful oxygen from juices during processing.

Poly-Coated Milk Cartons 42
New ½-gal. carton and packaging machines appeal to dairymen.

23 Highlights of Dairy Show 46
Automatic batchers, packaging, CIP, and process units displayed.

Freeze-Drying—*Special Report* 57
Sharp focus on processing, product quality, marketing factors.

Plastic Box Protects—Shows Off Product 70
Styrene tray-pack increases product visibility, guards quality.

Can-Flow Controls Curb Bottlenecks 73
Packaging costs drop when electronic monitors go into action.

Dock-Conveyor System Preloads Trucks Fast 80
Semi-automated distribution plant speeds retail truck loading.

Get the Consumer on Your Sales Team 84
Here's effective way for PR to sharpen your selling tools.

Additives—'Directs' and 'Indirects' Listed 87
Recent FDA rulings include rubber and rubber products.

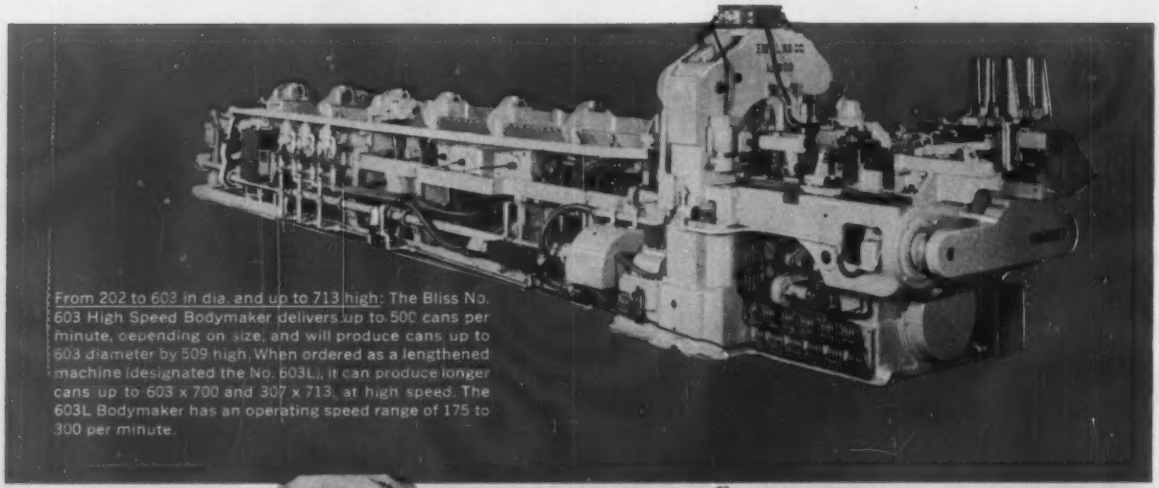
SPECIAL FE REPORT

Freeze-drying could be your key to new products and markets. The equipment and technology are available but, as always, product quality and cost will determine consumer acceptance.—p. 57.

BODYMAKERS BY BLISS

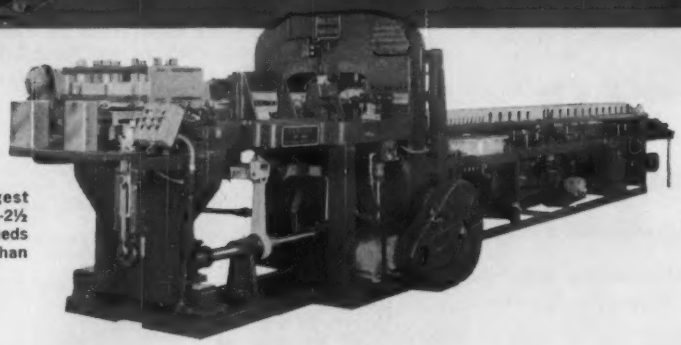
for every body size and type

These Bliss bodymakers cover the entire range of can sizes and shapes, from the smallest standard sanitary can, up to 2½ gallon tins. For complete information about any of them, write us today.



From 202 to 603 in dia. and up to 713 high: The Bliss No. 603 High Speed Bodymaker delivers up to 500 cans per minute, depending on size, and will produce cans up to 603 diameter by 509 high. When ordered as a lengthened machine (designated the No. 603L), it can produce longer cans up to 603 x 700 and 307 x 713, at high speed. The 603L Bodymaker has an operating speed range of 175 to 300 per minute.

1 Gallon and 5 Quart Cans, both round or rectangular are produced by the Bliss No. 604 Bodymaker at correspondingly high speeds.



The New No. 014 Bodymaker: The largest in the Bliss line the No. 014 produces 2-to-2½ gallon rectangular gasoline cans at speeds up to 60 per minute, 50-to-60% faster than any existing equipment.

BLISS SINCE 1857

BLISS is more than a name—it's a guarantee

E. W. BLISS COMPANY · Hastings, Michigan

Foreign Subsidiaries: E. W. Bliss (Canada) Ltd., E. W. Bliss (England) Ltd.
E. W. Bliss Co. (Paris) France, E. W. Bliss-Henschel G.M.B.H., Düsseldorf, West Germany

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CONTAINER MACHINERY • CONTRACT MFG. • PUBLIC SAFETY

FOOD Engineering

Chestnut & 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GRAHAM E. RIDDELL.....Publisher
FRANK K. LAWLER.....Editor

ALEX K. PORIANDA.....Managing Editor
JOHN V. ZIEMBA.....Senior Associate Editor Chicago
THAYER C. TAYLOR.....Associate Editor
LEONARD TRAUBERMAN.....Associate Editor
JACK L. MISCHOU.....Assistant Editor
ROBERT E. BAUR.....Production Editor
LAWRENCE J. WOODWARD..Editorial Assistant
GEORGE BAKER.....Washington Editor
PAUL WOOTON
Washington Member Editorial Board
GODFREY LEHMAN...California Correspondent
HOWARD KOHLBRENNER.....Art Director

Consultants

R. S. McBRIDE.....Technical
PAUL de GUZMAN.....Presentation
ROBERT GUNNING ASSOCIATES....Readability

IVAN C. MILLER.....Circulation Manager
FREDERIC H. LANDMANN..Marketing Manager
WARREN OWENS.....Production Manager
JOHN R. SAKOWSKI.....Production Assistant

JOHN H. KOFRON....Chilton Research Director

DISTRICT SALES MANAGERS

Atlanta 3.....JOHN W. SANGSTON
32 Peachtree St., N.E.....JAckson 3-6791

Chicago 1.....JOHN E. SNELL
360 N. Michigan Ave,.....RAndolph 6-2166

Cleveland 15.....VAUGHN K. DISSETTE
920 B. F. Keith Bldg.
Euclid Ave. & 17th St.....SUperior 1-2860

Dallas 6.....HAL MOTT
189 Meadows Bldg.
Expressway at Milton.....EMerson 8-4751

Los Angeles 57.....JACK KAY
198 S. Alvarado St.....DUnkirk 7-4337

New York 17.....FRANK W. McCARTHY
100 East 42nd St.....OXford 7-3400

Philadelphia 39.....JOHN A. MILLER
Chestnut & 56th Streets.....SHerwood 8-2000

San Francisco 3.....FRANK McKENZIE
1355 Market St.....UNderhill 1-7107

CHILTON OFFICERS & DIRECTORS

G. C. BUZBY, President

Vice Presidents: P. M. Fahrendorf, Leonard V. Rowlands, George T. Hook, Robert E. McKenna; Treasurer, William H. Vallar; Secretary, James A. Montgomery; Directors: Maurice E. Cox, Frank P. Tighe, Everit B. Terhune, Jr., Russell W. Case, Jr., Charles A. S. Heinle, John H. Kofron, George E. Cameron.

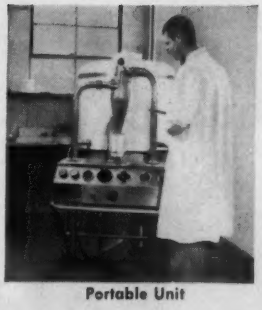
Comptroller, Stanley Appleby.

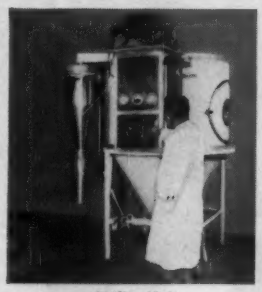
FOOD ENGINEERING (formerly Food Industries) December, 1960, Vol. 32, No. 12.

Published monthly by Chilton Company; Executive, Editorial, Circulation and Advertising Offices, Chestnut & 56th Sts., Phila. 39, Pa. Second class postage paid at Philadelphia, Pa.

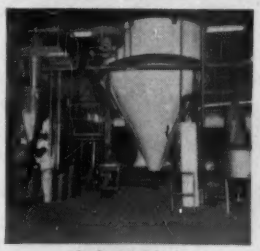
Title registered in U. S. Patent Office © Copyrighted 1960 by Chilton Company, all rights reserved.

Subscriptions are solicited only from men with management responsibility in manufacturing, marketing, packaging, engineering, and technology in companies engaged in food manufacturing. Position and company connection must be indicated on subscription orders. Send to Circulation Manager. Rates: U. S. Possessions and Canada for individuals in field of publication, $2.00 per year, single copies $1; all other foreign $25.00 per year.


Portable Unit


Utility Unit

Pilot Unit


Industrial Unit

NERCO NIRO®

SPRAY DRYER LABORATORIES

offer the largest, most modern and diversified facilities for research, engineering, testing and custom drying

Nerco-Niro maintains the most complete spray dryer laboratories in the Western Hemisphere.

The diversified dryer facilities permit research, testing and custom drying on the best suited scale. Tests may be started in laboratory-size equipment and progress in stages to full scale volume production or, research may be confined to any intermediate step. Analysis of raw material and finished product may be evaluated in our well-equipped analytical lab.

The four dryers pictured at the left are equipped with all stainless steel contact surfaces. Throughout the laboratories, process steam is furnished for the jacketed tanks and pipes. Modern receiving and storage facilities are available for all types of shipment.

You are cordially invited to visit and inspect our facilities. Arrangements must be scheduled in advance so as not to conflict with confidential spray drying tests being conducted for our clients.

Nerco-Niro Spray Dryer Div.

NICHOLS

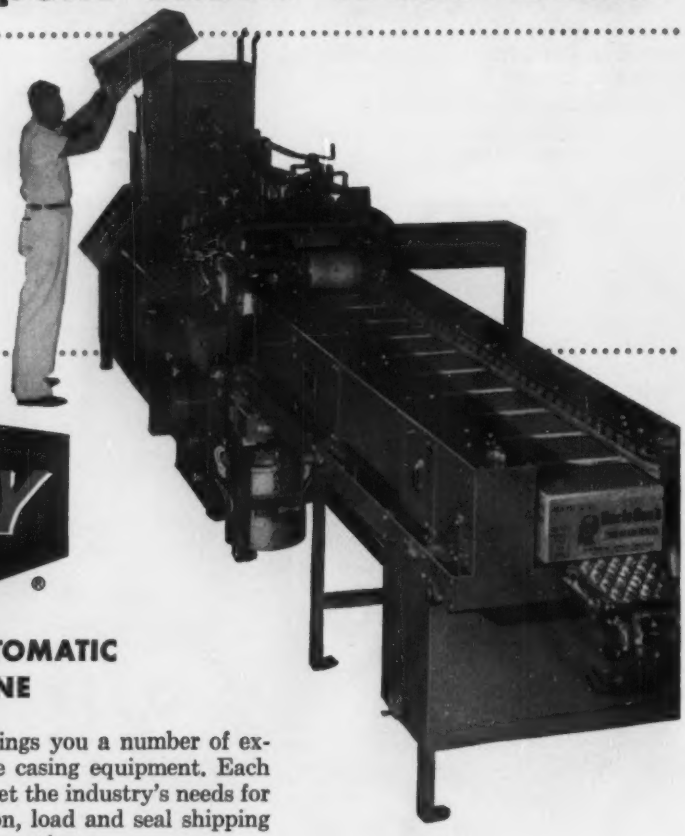
Nichols Engineering & Research Corp.
80 Pine St., New York 5, N. Y.

San Francisco Indianapolis
Montreal

INTRODUCING A NEW MODEL IN THE PROVEN LINE OF SURE-WAY PACKAGE CASERS

Automatically opens cases—loads—seals

smooth
sure
—up to 25
cases a minute



SURE-WAY®

MODEL M-41 FULLY AUTOMATIC INTEGRATED CASING LINE

The Model M-41 "Sure-Way" brings you a number of exclusive features in fully automatic package casing equipment. Each of these features is carefully designed to meet the industry's needs for a fully *automatic* machine to erect, position, load and seal shipping cases in a continuous high-speed, in-line operation.

Shut downs and bottlenecks are eliminated. Operating costs are reduced. To sum it all up, here is the machine that helps build profits. Here are a few of the major features:

The new shipping case feeding and erecting mechanism employs duplex vacuum cups which are cam activated, stripping the bottom case from the vertical stack of 125 or more flat shipping cases.

New pressurized gluing system, incorporating "No case-No glue" device, gives greater uniformity of glue application, cuts maintenance and cleanup time. Intermittent motion of the compression unit allows maximum dwell time in minimum floor space – the average unit is less than 29' long, overall.

Complete console station centralizes all control of the machine, ensuring a smooth uninterrupted operation. Safety interlock switches throughout provide sure, positive functioning. Write for full information or call your nearest FMC representative.

The automatic case erecting-positioning assembly and the sealing-compressing assembly are available separately for existing installations of "Sure-Way" Casers.

"Sure-Way" Model M-41 integrated casing lines are operating in several leading plants. Shown here is one of two complete lines at the Houston plant of Uncle Ben's, Inc. Others already installed, or scheduled for early delivery, will be handling a wide variety of packaged products such as aluminum foil, cake mixes, sugar, soap and detergents. There is virtually no limit to the range of packages, patterns, case sizes and casing combinations the "Sure-Way" can handle.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

TRENDS & FORECASTS

Food and beverage sales will set record in '61. Manufacturers forecast gains of 2 to 7%, which will lift business into $57 to $60 billion range.

Total food sales will be in $83 to $87 billion bracket next year.

Foods and beverages enjoyed almost 5% boost in those years of past decade in which sales of consumer durables were slack. They gained only 2.5% when people were on hard goods buying spree.

Food prices are expected to remain near this year's level in '61. This means 2% below '58. Supplies will about match population.

Meat consumption is forecast at new high in '61. Most of 4-lb. per capita increase will be in beef. Poultry will be more plentiful, too.

USDA sees small increases for margarine and frozen vegetables. Some reductions are anticipated for dairy products, eggs, and canned juices. Little change is expected for other foods.

With public confidence restored, cranberries are making healthy comeback. USDA puts '60 crop at 1,344,000 bbl., up 100,000 bbl.

Consumer income continues upward. At mid-November it was 5 to 6% above last year. As economic growth resumes in '61, incomes will rise further, USDA's Nathan M. Koffsky predicts.

Industrial expansion continues in Western Europe, at rate less than phenomenal growth of recent years. Japan still grows rapidly. Business reached peak in Canada early in '60 and declined.

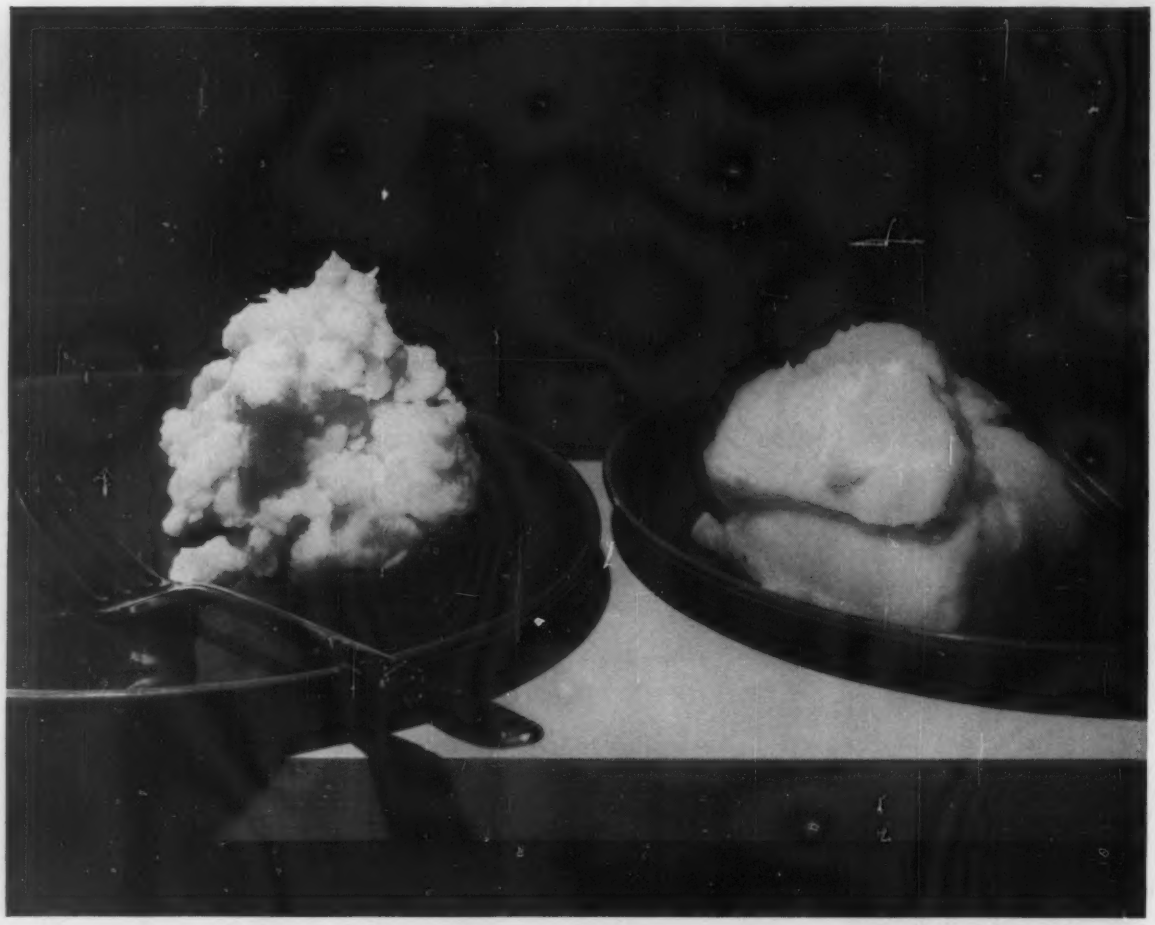
September sales in retail food stores were 4% over year ago, or $4,442 million. Business in eating and drinking places was up 2%, to $1,341 million, according to U. S. Dept. of Commerce.

1960 packs: Canned sweet corn, 34,435,087 cases, off 14%. Canned blackberries, 286,847 cases, down 51%; boysen, logan, and youngberries, 121,347 cases, down 52%. Sauerkraut, 6,280,492 cases, off 11%.

World food and agricultural production gained 2% in past year, slightly more than population. Further increase is expected, says FAO.

See Developments to Watch p. 13

Prime opportunity in Australia is production of frozen fruit juice concentrates, Stanford Research Institute study indicates.



After and before

Look at these two dishes of "instant" mashed potato. There is only one difference between them.

The one on the left contains ½ of 1% of *Myverol Distilled Monoglyceride, Type 18-00.** It looks, tastes, and feels to the palate like just-mashed potato. The one on the right, with no monoglyceride, is a sticky, pasty mess.

No one will be offended by this comparison because as far as we know there is very little, if any, instant mashed potato on the market that does *not* contain monoglyceride. Monoglyceride is one big reason why the instant mashed potato idea has been such a success.

Since all the instant-potato producers must know this already, why do we spend money advertising to them?

Ah, not to them is this ad directed. It is directed to producers of *other* starchy foods who have a stickiness or pastiness problem. We want them to understand the principle: *free amylose, put into solution during cooking, is complexed by high-purity monoglyceride so that its molecules cannot hydrogen-bond themselves into a gelatinous mass.*

Myverol Distilled Monoglycerides are officially recognized as safe. For samples and information on their use, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

**Type 18-00* is made from hydrogenated lard. *Type 18-07* from hydrogenated cottonseed oil gives exactly the same effect.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

Schedule of Events

December

19-21—American Management Assn., meeting; Hotel Astor, N. Y. C.
26-31—American Assn. for the Advancement of Science, annual meeting; Philadelphia.
28-30—American Marketing Assn., winter conference; Coronado Hotel, St. Louis.

January

8-10—National Preservers Assn., meeting; Galt Ocean Mile Hotel, Ft. Lauderdale, Fla.
22-25—National Canners Assn. and Canning Machinery & Supplies Assn., 54th annual conventions; Conrad Hilton, Chicago.
23-26—Plant Maintenance & Engineering Show; International Amphitheater, Chicago.
29-F1—Canadian Food Processors Assn., meeting; Prince Edward Hotel, Windsor, Ont.
29-F1—Super Market Institute, mid-year meeting; Americana Hotel, Miami Beach, Fla.

HORS D'OEUVRES

To deliver food to men in satellites, spacecraft will be developed for the Air Force. Bit of a change in food distribution since Barney Kroger's day!

Supermarket buying committees reportedly reject as many as 96% of new products submitted to them. Such wisdom can only be assumed!

Secretary Flemming gave cranberries his full blessing this year. And the industry hopes that he, too, had a happy Thanksgiving.

Convenience products out-gained others 35% in sales last year. Naturally! The "maid in every package" boosts impulse sales to men shoppers.

Control of evolutions is coming within man's grasp. Scientists are learning how creatures communicate biological specifications to their offspring. Guess we'll have to take Frankenstein movies more seriously.

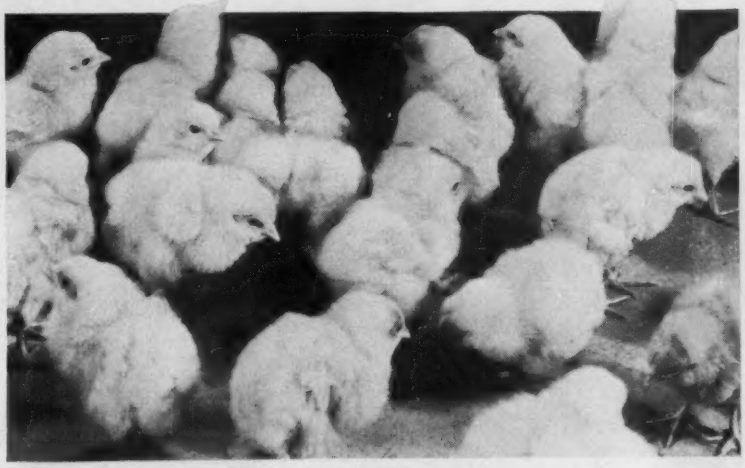
Promoting business with gift candy boosts confectioners' sales as much as 19%, says NCA. But sweets have been effective in promoting things ever since the Gay Nineties.

Eating out costs have risen 15% in 5 years. But the price of home cooking is up only 3%. Mother obviously is underpaid.

"Das ist gut"—"Schmeckt prima"—"Wunderbar." That's what Germans had to say about American foods at the Munich Fair. You've said it yourself: "This is good"—"That's terrific"—"Wonderful."

The "Irish" potato was cultivated by the ancient Incas of Peru. Conquistadors wiped out the Indian civilization and took the spuds to Europe. Least we could do is to call them "instant Incas."

when we grow up
we'll be wrapped in West Carrollton
Genuine Vegetable Parchment



YOU can make sure that all the rich, tempting, sales-winning goodness of your poultry reaches the ultimate consumer, by using West Carrollton giblet wrappers, plain or printed, crate liners and individual wrappers.

Wrappers made of this fine, time-proven parchment are ODORLESS, TASTELESS, NON-TOXIC, GREASE-RESISTANT and STRONG—wet or dry.

Write for samples and complete details.

West Carrollton Parchment Company • West Carrollton 49, Ohio • P.O. Box 98

SALES OFFICES:
New York 13, 99 Hudson St. • Chicago 6, 400 West Madison St. • Boston 10, 10 High St.

West Carrollton GENUINE VEGETABLE Parchment

serving the food industry since 1896

AUTOCLAVE PARCHMENT
BACON WRAPPERS
BAKERY PAN LINERS
BUTTER BOX LINERS
BUTTER TUB LINERS & CIRCLES
BUTTER WRAPPERS
CAKE DECORATORS
CELERY WRAPPERS
CHEESE WRAPPERS
FISH FILLET INSERTS & WRAPPERS
GIBLET WRAPPERS
GREETING CARD PARCHMENT
LARD CARTON LINERS
LINERS FOR MEAT TINS
MARGARINE WRAPPERS
MASTER PARCHMENT
MEAT WRAPPERS
MILK CAN GASKETS
PARCHMENTIZED KRAFT
POULTRY BOX LINERS
POULTRY WRAPPERS
RELEASE PARCHMENT
SAUSAGE WRAPPERS
TAMALE WRAPPERS
TRI-WRAP & DUO-WRAP FOR SMOKED MEATS
VEGETABLE SHORTENING CARTON LINERS

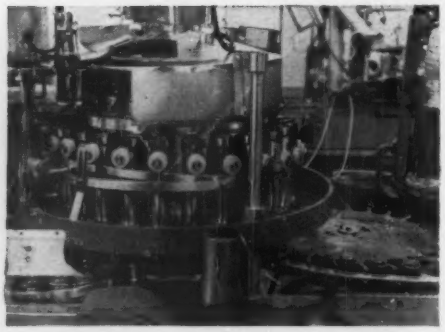
SILICONE • MYCOBAN • QUILON & DRY WAXED PARCHMENT
CLEAN FOOD PAPER—For Delicatessen and Grocery Stores, also Fish and Meat Markets.

CIRCLE 9 ON READER SERVICE CARD

Votator® PISTON FILLER'S

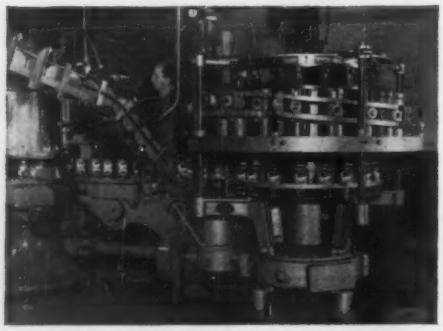
NEW MAGNETIC VALVE

The Magnetic Monitor* Valve Control† on VOTATOR piston fillers consists of a combination of indestructible permanent magnets and the pneumatic lift for positioning the valves. This assembly, with only two moving sections, provides:



Courtesy Gerber Products Co.

New, higher standards of packaging economy are being realized by processors of a wide variety of products. VOTATOR Piston Fillers give close-tolerance filling of liquids and viscous materials at remarkable speeds. No-container, no-fill controls safeguard against interruption of operation and waste. And, new Magnetic Monitor valve control prevents costly damage and downtime.



Courtesy Castrol Oils, Inc.

a. Positive no-container, no-fill operation.

b. The elimination of every possibility of a valve jam due to over-sized particles in the product or the malfunction of any associated equipment.

c. A completely smooth valve action to eliminate all splashing of product.

VOTATOR PISTON AND GRAVITY FILLERS ARE AVAILABLE FOR ALL PRACTICAL SPEEDS AND CONTAINER SIZES

Another VOTATOR Piston Filler *first* bringing you still more advantages and savings. Write today for Bulletins PED-259 and PED-260.

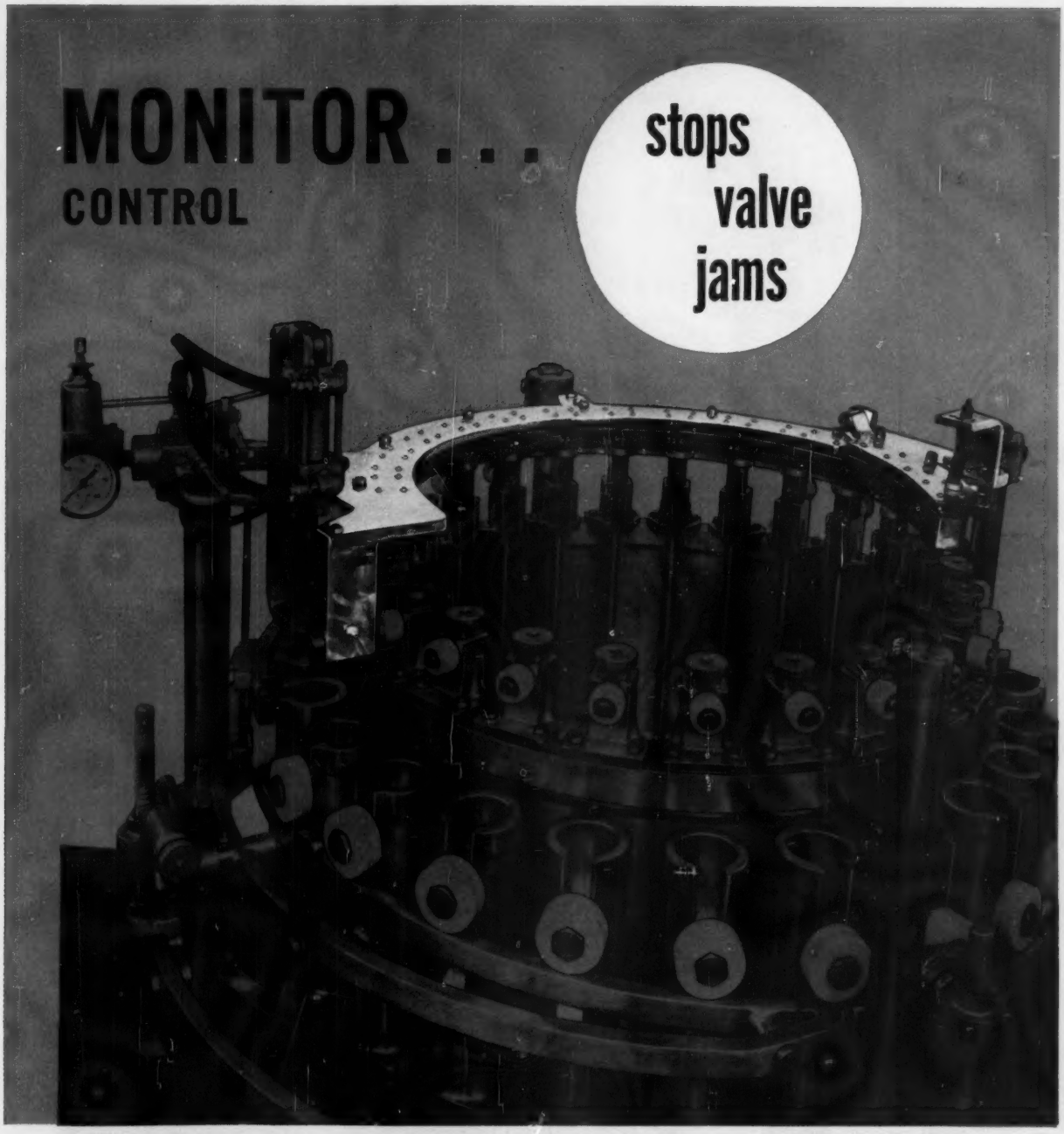
GIRDLER PROCESS EQUIPMENT DIVISION
CHEMETRON CORPORATION
Louisville 1, Kentucky

CHEMETRON

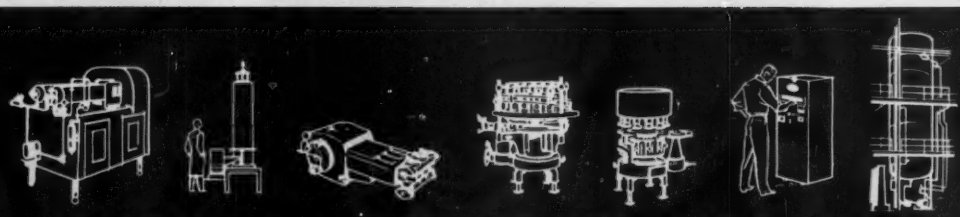
Sales Offices: Louisville • New York
Chicago • Marietta (Georgia) • San Francisco

MONITOR . . .
CONTROL

stops valve jams



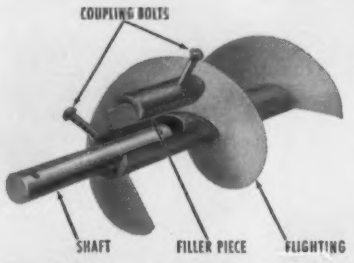
*Trademark †Patent pending



VOTATOR CONTINUOUS PROCESSING EQUIPMENT FOR CHEMICAL & FOOD INDUSTRIES • VOTATOR PISTON & GRAVITY FILLERS • VOTATOR PLANTS FOR FATTY OILS INDUSTRY • THERMEX DIELECTRIC HEATING EQUIPMENT

How Quik-Link conveyor screws

KNOCK DOWN DOWNTIME



HOW IT WORKS — First, coupling bolts and filler pieces are removed from each end of screw section to be replaced. Then the hanger is unbolted, and entire section lifted from trough.

Only LINK-BELT Quik-Link lets you remove a single section without disturbing other components

Here's how you can side-step a serious production bottleneck. Quik-Link offers the fastest method yet of replacing a damaged screw and putting the conveyor back into service. Just a fraction of the normal time.

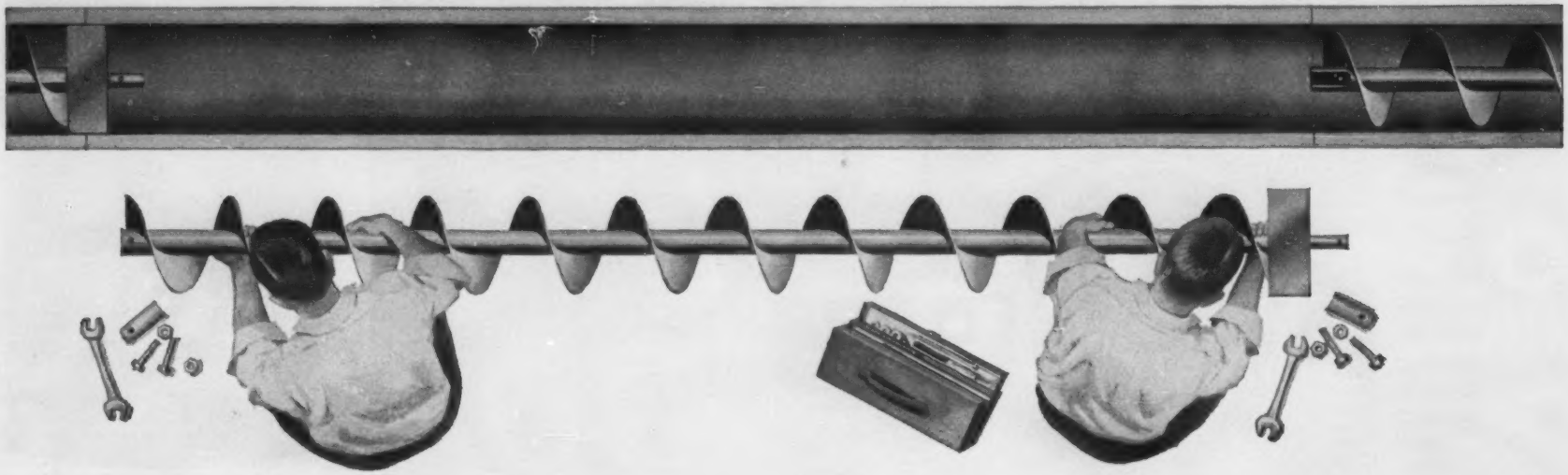
That's why it's time you investigated the "down-time insurance" built into every section of Link-Belt Quik-Link conveyor screws. Your maintenance men become quick-change artists in no time—a wrench and 30 minutes change the damaged screw section and put the conveyor back to work. What's more, there is no need to pull down the entire line . . . no need to disturb other conveyor components.

Quik-Link is just one of a whole group of Link-Belt screw conveyor components that are cutting maintenance and power requirements to the bone. For full facts call your nearest Link-Belt office or authorized stock-carrying distributor. Or write for Book 2989.

LINK-BELT

SCREW CONVEYORS 15.239

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.



CIRCLE 12 ON READER SERVICE CARD

DEVELOPMENTS TO WATCH

Feed manufacturer uses computer to calculate blends on basis of prices of ingredients, and without nutritional variation.

Dehydrated honey is made by process developed by USDA. Product retains flavor and color for year at normal temperature.

Whole fresh lemons, including seeds and rind, are spray dried to stable powder by Test Laboratories. Whole ripe tomatoes spray-dried in '58 still retain quality.

Citrus juice is made sweeter by new electro-dialysis ion exchange process. Method is reported to be cheaper than adding sugar.

Acid-modified wheat flour is equal to commercial sizing material for imparting strength to paper, according to USDA. Flour is reacted with ethylene or propylene oxide.

Improved way to bleach cottonseed oil has been developed by USDA. It involves use of activated alumina, along with higher temperatures than those presently employed.

Twenty famous international dishes have been placed on food service market by Armour. Individual portions are packed in compartmentalized plastic pouches and quick frozen.

Leak-proof poly-coated milk cartons have been introduced by three firms, along with machines to form, fill and seal.

Solubilized spice oils are pressure dispensed in droplets by special valve. Fifteen have been tested by John S. Stalfort & Sons.

New method for unloading grain from tankers is speeding delivery around world. Grain is blown from ship tank to dock-side through flexible hose having stainless steel liner.

Bread bakers can go from scaling to baking in 2 hr. with new Reddi-Sponge that develops dough instantly during mixing. Prefermentation is eliminated, and 5 hr. is saved in processing time by Western Condensing Co. development.

Resistance of young citrus trees to frost damage is increased by spraying with chemical that puts trees into temporary dormancy. U. S. Rubber makes chemical.

New heat sealable rigid carton that requires no overwrap has been developed in England and introduced here by Continental Can. Automatic set-up and closing machines are available.

See Who's Building What p. 17

Washington Report p. 21

Cherry-Burrell knocks the wind out of peanut butter

It's a peanut's lot to be crushed, cracked, crumpled and thrown at umpires. But after they're made into peanut butter, they're given the treatment of their lives to remove air from the product. Any air that's left affects flavor and short-fills jars. One Eastern processor needed a more effective method of deaerating peanut butter. He asked Cherry-Burrell to solve the problem.*

Cherry-Burrell engineers studied the situation and recommended a modified vacuum-pressure Round Processor. A special disperser injects a thin film of peanut butter into the processor, exposing trapped air to the vacuum. Specially designed agitators promote faster heat transfer and float trapped air to the surface. Unique surface breakers allow air to escape and to be removed by the vacuum. Now the manufacturer's peanut butter stays flavorful in the jar, and each jar is filled full every time.

Highly trained technicians will test your product without obligation in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing. Call or write Cherry-Burrell today.

** Case history on request.*

EQUIPMENT FOR HOMOGENIZING, HEATING, COOLING, FLAVORIZING, STORING, SEPARATING, FREEZING, MIXING, PACKAGING AND CONVEYING. WRITE FOR YOUR FREE CATALOG.

CHERRY-BURRELL CORPORATION
CEDAR RAPIDS, IOWA

CIRCLE 15 ON READER SERVICE CARD

HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

The latest addition to Hercules' full life of HVP powder and liquids and MSG, HVP-Century offers many possibilities for cost savings and processing advantages.

A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

Who's Building What ...

Monthly Reports: These food firms will spend $1,756,100 for expansion.

Low Bids/Contracts

American Beauty Macaroni Co., Dallas, Tex., manufacturing & packing plant, $500,000.

Carling Brewing Corp., Mansfield, O., warehouse, $200,000.

Golden Grain Dairy Products Co., Lewiston, Idaho, processing plant, $200,000.

Green Giant Co., Glencoe, Minn., warehouse, $218,800.

Kraft Foods, Omaha, Neb., warehouse, $195,000.

Pet Dairy Products Co., Winston-Salem, N. C., dairy plant, $122,300.

Prosser Packers, Prosser, Wash., food packing plant, $210,000.

Smithfield Packing Co., Smithfield, Va., meat processing plant, $110,000.

Proposed Projects

Columbo's Italian Pizza Bakery, Dallas, Tex., bakery, $110,000.

General Foods Corp., Canandaigua, N. Y., processing & refrigeration plant, $2,000,000.

Holsum Baking Co., Port Arthur, Tex., plant, $425,000.

Krispy Kreme Doughnut Co., Norfolk, Va., plant, $125,000.

National Dairy Products Corp., Paoli, Pa., distribution plant, $110,000.

Pepsi-Cola Bottling Co., Richmond, Va., plant, $1,000,000.

Pillsbury Co., Minneapolis, Minn., plant, $2,000,000.

Prince Macaroni Mfg. Co., Lowell, Mass., warehouse, $450,000.

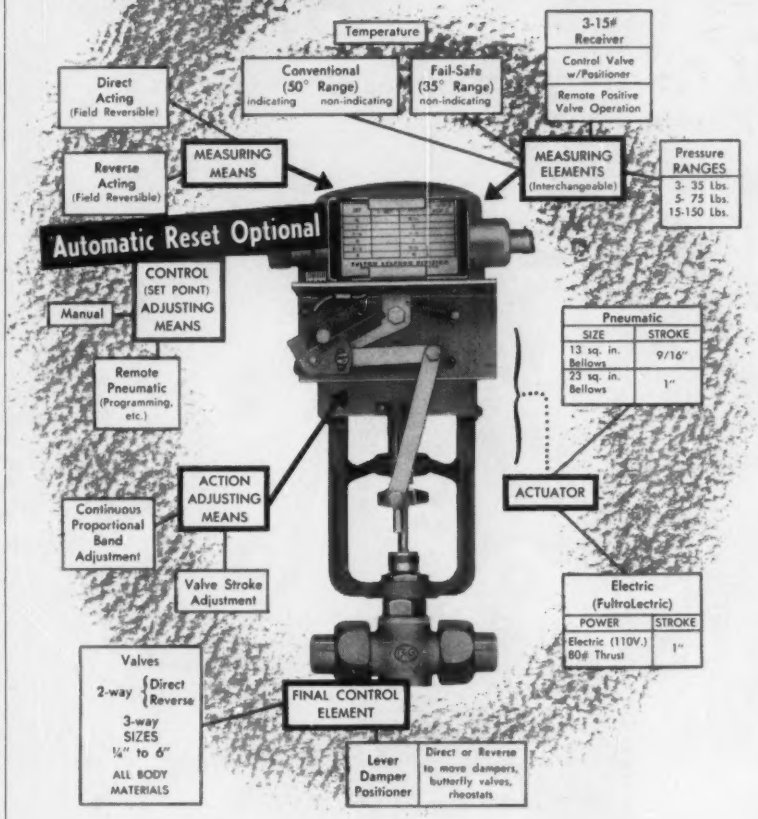
Scaeffer Meat Co., Pennsauken, N. J., meat packing plant addn., $110,000.

Southern Bakeries Co., Atlanta, Ga., bakery addn., $300,000.

GREATEST FLEXIBILITY IN POWERED CONTROLLERS!

THE NEW FultroMatic® 3-IN-1

Controller·Positioner·Valve



Adding the precision performance of pneumatic control to the ruggedness and simplicity of our famous self-ops, the "one-package" FultroMatic gives positive control for process temperatures or pressures, with wide choice of ranges . . . at about half the cost of 2- and 3-unit systems. For complete data, write today for Bulletin **XG-755. Fulton Sylphon Division, Robertshaw-Fulton Controls Co., Knoxville 1, Tennessee.**

Robertshaw®

MR. CONTROLS

CIRCLE 17 ON READER SERVICE CARD

CIRCLE 18 ON READER SERVICE CARD →

It's true, you *can* package sour cream in Pur-Pak cartons when you use ESKAR Dairy Wax Special. Carton resistance has to be good, of course, and it is with ESKAR. In one test, a dairy stored sour cream in ESKAR Special coated cartons for two weeks with no effect on carton or contents.

ESKAR Dairy Wax Special gives cartons an especially good, uniform film with a fine sheen. It penetrates the stock in just the right amount to give the cartons improved firmness. And build-up of wax that causes jamming on the machine is minimized or eliminated completely when you use ESKAR Dairy Wax Special.

Perhaps ESKAR Wax Special can help you open up new markets for sour cream—and new economies in packaging. Get more facts about this wax. Call the Standard Oil office nearest you in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

You expect more from **STANDARD** *and you get it!*

Keep Faith with Nature—Guard her Goodness

Standardize—don't jeopardize. Nature never standardizes vitamin C content. Vegetables vary—uniformity varies. Nature's never uniform. Your juice blend should be. Guarantee vitamin C potency. Keep quality high to satisfy.

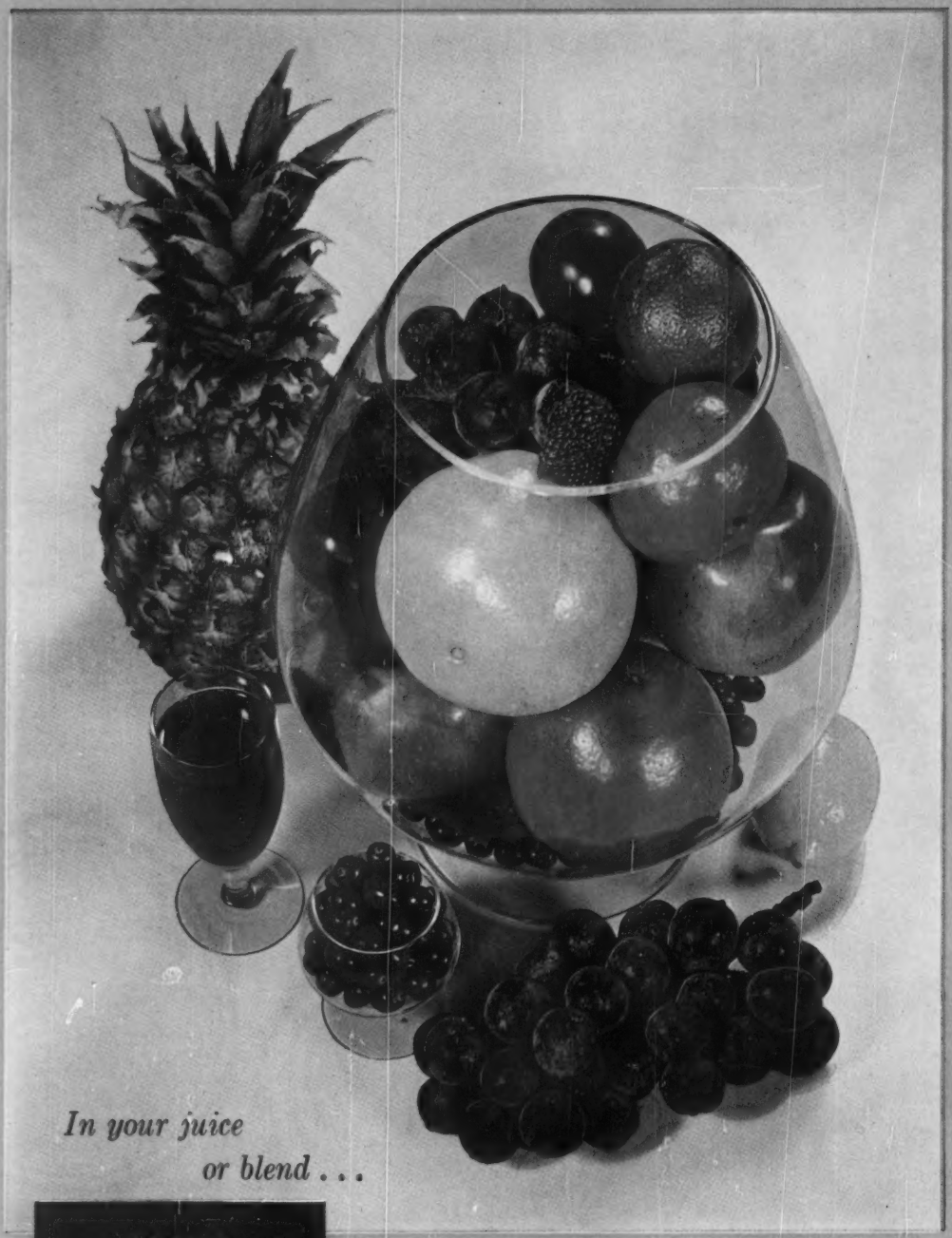
Standardize—don't jeopardize. Standardize with Roche vitamin C (ascorbic acid)—and capitalize on giving your juice blends: acceptable vitamin C levels, added flavor richness (because you can process vegetables at their flavor peak), a nutritional value to claim on your label.

Standardize on Excellence with **ROCHE**® Ascorbic Acid

FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.** Nutley 10, New Jersey

©1960 HLR INC.

Keep Faith with Nature—Guard her Goodness



In your juice
or blend . . .

ROCHE VITAMINS
cost just a fraction of a penny per serving

ROCHE VITAMINS
can bring you increased dollars in sales

STANDARDIZE—*don't jeopardize*

Nature never standardizes the vitamin C content of fruits. Nature's never uniform. Uniformity varies. So *standardize*—don't jeopardize—juice uniformity!

Standardize on juice excellence, with Roche® vitamin C (ascorbic acid). Capitalize on quality. Give fruit juices and blends: acceptable vitamin C levels, ripe-fruit-flavor richness, a nutritional claim for your labels.

©1960 HLR INC.

FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.** Nutley 10, New Jersey

Washington Report

Labor Shapes Up Strong Food Drive

Will food companies be saddled with nation-wide labor contracts—as is the case in steel and auto industries? That's the long-range poser observers are mulling in the wake of plans by top AFL-CIO leaders to give their blessing in February to a giant combine of food unions. About 750,000 union members will be covered by a "food workers council." If the idea catches on, membership could climb to 2 mill. or more.

Individual unions will do their own contract bargaining, for officials concede that there is too much diversity to try for a common contract. But the combine could become a challenge to James Hoffa, whose Teamsters Union has made some big gains in organizing food industry segments.

Freezers Blast Probe on Prepareds

A forthcoming FDA report that criticizes alleged insanitary practices in frozen pre-cooked food plants has packers up in arms. Set to be published next March, the survey links bacteriological counts with in-plant sanitary conditions.

A National Assn. of Frozen Food Packers spokesman called the report "unfair" because it doesn't spell out what the goals or standards for bacteria count should be. He also accused FDA of irresponsibility in confusing consumers by alluding to "insanitary practices" without saying what should be done.

A second observer, noting that all meat-containing frozen food products are packed under continuous USDA inspection, wonders aloud whether FDA is indirectly attacking its sister department.

FDA inspected 63 plants in '58 and '59, examined some 3,000 samples of 81 items. Agency admits that many of the conditions complained about have since been corrected. But freezers should reduce time between preparation and freezing (or cooling at least to 40 F) to prevent bacteria buildup, FDA report says.

Report on Food Industry R&D

Out of the $7.2 billion devoted by all U. S. industry on research, food manufacturers spend just $68 million. Most of this is spent inside the company—only 3% of all food R&D is "farmed out." You can get an explanation of these and other figures in a new government publication. "Funds for Research and Development in Industry, 1957," 65¢. Government Printing Office, Washington 25, D. C.

Sugar: Small Law, Then Big Act

Congress must move fast to extend present sugar law while it readies a new, long-range Sugar Act (which expires March 31). Because that leaves little time to legislate a cool-headed long-range program, a short-run extension seems likely. USDA will tell House Agriculture Committee in January what should be included in a long-range law.

One thing is clear: There's plenty of sugar available, even without the 4-5 mill. tons Cuba used to export here. Most experts now think Congress should leave the door open for Cuba to return as a supplier, on the ground that Castro's days now appear to be numbered. There's one tickler, though: Whether our trade embargo will force Cuba to refit mills and refineries with Russian-made parts.

FDA Seizure Powers Challenged

The question of whether FDA can seize goods which move intrastate only is up before the courts again. Latest go-round involves A. M. S. Packing Co., New York City, whose Pinnochio brand cooking oil was seized by the agency on the alleged grounds of having little or no pure olive oil. The packer contended FDA lacked the right to seize his merchandise since it moved entirely within N. Y. state.

A Syracuse, N. Y., Federal District Court upheld the packer's argument. FDA, appealing the decision, fears its seizure work would be cut back sharply if the decision is not overturned.

Seek Up-Dated Business Facts

New and more useful government data on food may be forthcoming, thanks to the Federal Statistics Users' Conference. Improved technology has obsoleted some statistical series. For example, an old-line series on pig production is of little value to processors because animals are born, raised, and slaughtered before USDA hog reports are published.

Need today is for "finer" (detailed) data and for fewer of the old basket categories which lump food and drug production and marketing figures together.

FDA Looks to Industry

To help accelerate research into color additives, a special suppliers group will soon be named. At a FDA-industry Washington confab, Deputy Commissioner John Harvey pointed out that FDA facilities and finances are limited, and that industry must help shoulder the burden to avoid duplicate research and speed data results.

The move is a partial answer to food industry expert Dr. Bernard Oser's suggestion that an inde-

WHEN THE PRODUCT YOU PACKAGE IS

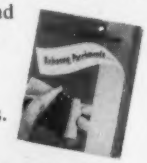
STICKY

PATAPAR RELEASING PARCHMENT WILL PROVIDE THE "LET-GO" YOU NEED

Here, the packager has to worry about a substance whose moisture and sugar content results in extremely adhesive qualities . . . but the product must never stick to its container. Patapar Releasing Parchment provides the needed combination of resistance to moisture and sugar penetration, and low adhesion factor.

Other Patapar Releasing Parchments provide quick release for foodstuffs such as frozen meats, where ice makes separation difficult . . . plastics, where extreme temperatures and inherent tackiness make it necessary to include the releasing parchment in the production process . . . and adhesive materials, where the product can stick to itself or its user.

Send for free samples of Patapar Releasing Parchments and informative brochure describing the whole Paterson line of Releasing Parchments.



Patapar®
RELEASING PARCHMENT

75th ANNIVERSARY · SPECIALTY PAPERS FOR INDUSTRY · SINCE 1885

PATERSON PARCHMENT PAPER CO.
BRISTOL, PENNSYLVANIA
Sales Offices: New York, Chicago • West Coast Plant: Sunnyvale, Cal.

pendent scientific committee be organized to review FDA findings on cancer-associated additives prior to final decisions.

Census Data 'Off-Limits'

U. S. Supreme Court upheld the privacy of Census Bureau records. Justice Dept. and FTC wanted the right to examine the records in connection with their antitrust prosecutions. Ruling against the trustbusters, the high court upheld Beatrice Foods' refusal to make available copies of records given in confidence to Census.

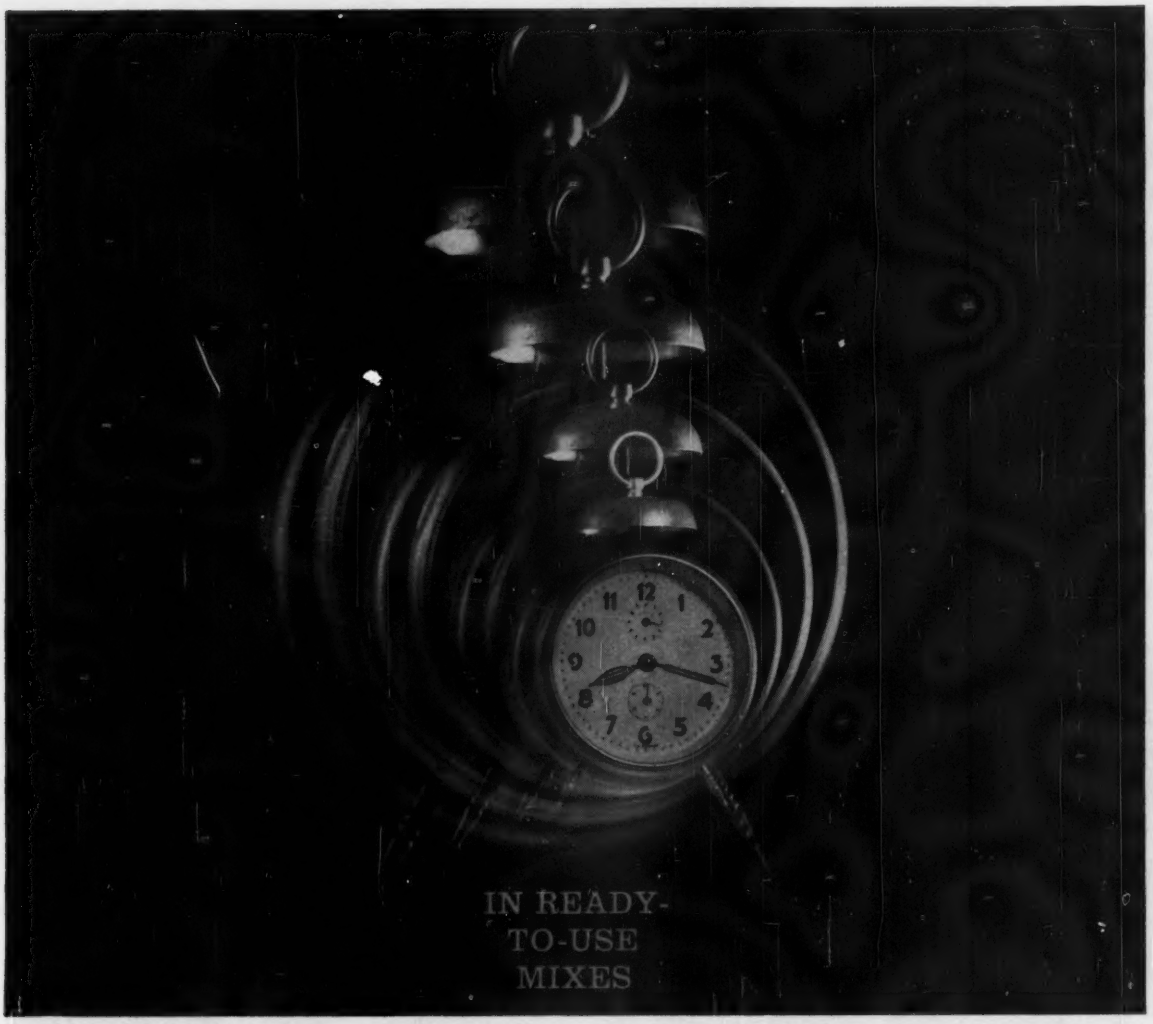
Significance: Data you give to the Census Bureau will continue to be held in confidence, as in the past. This point is particularly important to companies that compete sharply, for Census records are a goldmine of information on market-share and sales activities.

BRIEFS

Coal tar color used in maraschino cherries and hot dog casings (Red No. 1) is banned by FDA. Experiments show that color produces liver damage to test animals and safe level has not been established, FDA says. National Canners Assn. says ban on Red No. 1 does not affect canned fruit cocktail and canned fruits for salad. Canada will cooperate with U. S. in banning coloring's further use, but will not withdraw present goods from market.

FDA postponed final action on portions of order pertaining to definitions and standards of identity for ice cream, fruit sherbert, and water ices. Order amending standards of identity (effective Nov. 16) for French dressing, salad dressing, and cheeses, processed cheeses, cheese foods, cheese spreads, and related foods, remains unaltered as published Sept. 17, 1960.

USDA is considering revision of U. S. standards for canned mushroom grades. If made effective, revision will be fourth issue of Grade Standards for this product.



GLUCONO-DELTA-LACTONE LEAVENS LIKE CLOCKWORK

SAVES ITSELF TILL BAKING TIME... THEN SPRINGS INTO ACTION!

● Laboratory and field tests continue to confirm the excellence of Pfizer's Glucono-Delta-Lactone as a chemical leavening agent in baked goods.

Of specific interest to mix manufacturers is G-D-L's observed low level of activity in storage and at the mixing stage. There is very little loss of leavening power throughout normal shelf life and carbon dioxide release during mixing is slight. The gas is developed mainly at the elevated temperatures of the baking cycle—a distinct advantage where a chemical leavening action can be used and where long shelf life is a factor!

Products leavened with G-D-L have a fine, even texture, show excellent volume, and are free of unpleasant aftertaste.

Investigate G-D-L for use in such products as MUFFINS, DANISH PASTRY, RAISIN AND OTHER BREADS, ROLLS, BREAD STICKS AND PIZZA PIES.

Pfizer

Chas. Pfizer & Co., Inc., Chemical Sales Div.
630 Flushing Ave., Brooklyn 6, New York
Branch Offices: Clifton, N. J.; Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Tex.; Montreal, Canada

SCIENCE FOR THE WORLD'S WELL-BEING • QUALITY INGREDIENTS FOR THE FOOD INDUSTRY FOR OVER A CENTURY

Please send me:

☐ G-D-L Technical Data

☐ Suggested G-D-L Formulations

☐ A free sample of G-D-L

Name_____

Title_____

Company_____

Address_____

City_____ State_____

FE

TOP-OPENING CARTONS

new packages & products

FLIP-TOP CARTONS FOR ICE CREAM

Two varieties of top-opening ice cream cartons are receiving swift, enthusiastic consumer acceptance.

Beatrice Foods is using the Flip 'n 'Dip carton introduced by Marathon Div. of American Can Co. for Meadow Gold Royal Danish Frozen Dessert. Shipped flat, carton is set up, sealed, filled, and closed completely automatically on a new high-speed line.

Kemps Ice Cream Co., Minneapolis, markets its half-gallon in end-sealed, top-opening cartons with no locking end flaps. Carton's panels are machine sealed after being set up and filled on an Anderson filler specifically adapted by Marathon for the Top-Serv containers (401).

OLD AND NEW MIX

NEW STYLING FOR PREMIUM CAKE MIX

A premium Swans Down cake mix in 16 different flavors and a redesigned package is being marketed by the Jell-O division of General Foods Corp.

Package has been standardized for all flavors to increase appeal, provide greater protection, and simplify its use. Traditional overwrap is dropped by printing directly on the container. Other printing changes permit easier palletizing, quicker case and flavor recognition, and easier pricing for dealers.

TEST MASHED POTATOES IN ECONOMY CAN

Now in test markets at Cleveland, Syracuse, Indianapolis, and Providence are 21-oz. economy cans of Betty Crocker Instant Mashed Potatoes from General Mills.

GM markets most of its Mashed, Au Gratin, and Scalloped potato products in boxes, but points up can's features of guaranteed perfect freshness, reclosure, and compactness as potential merchandising tools.

GM's can was developed by American Can Co. (402) and designed by Lippincott & Margulies (403).

MASHED POTATO CAN

GALLON MILK CARTON DEBUTS AT EXPOSITION

The first one-gallon paperboard milk carton in the dairy industry is expected to be available commercially "sometime in '61."

Carton from Packaging Equipment Div. of Ex-Cell-O Corp., is reported to weigh less than 5-oz. unfilled as opposed to an unfilled glass jug which weighs almost 3½-lb. It occupies 25-sq. in. of dairy case space

compared to 36-sq. in. for jug, enabling retailers to place 33% more gallon units in display cases.

Regular Pure-Pak features are included—easy opening, sanitary pouring spout, top printing, no deposit, gable top, etc. (404).

POLY INNERWRAP FOR BREAD PACKAGING

Polyethylene film, in ½ to ¾ mil gauges, is now being used successfully as an innerwrap for bread packaged in waxed paper.

Film is claimed to double moisture protection and freshness (at ¾ mil) of bread previously packaged in waxed paper alone and provides a ready-made bag, easily closed after opening.

Combination wax paper and poly innerwrap can be merchandised to the consumer at an additional cost of less than 3¢/loaf. The Kordite Co. is film supplier (405).

CARRY-HOME CARTON FOR ARNOLD COOKIES

Increased sales and greater product protection are goals in Arnold Bakers' switch from paper bags to tall (10¼-in.), sturdy cartons with special carry handles.

Features are an auto-lock bottom, bellows top, and specially designed "Kuki-Lok" tuck-in closure immediately below cut-out handle.

The 5-color cartons are printed in Fidel-I-Tone by Lord Baltimore Press (406) on IPX virgin fibre clay-coated board from International Paper Co. (407).

AIR-TIGHT FILM FOR WEINERS

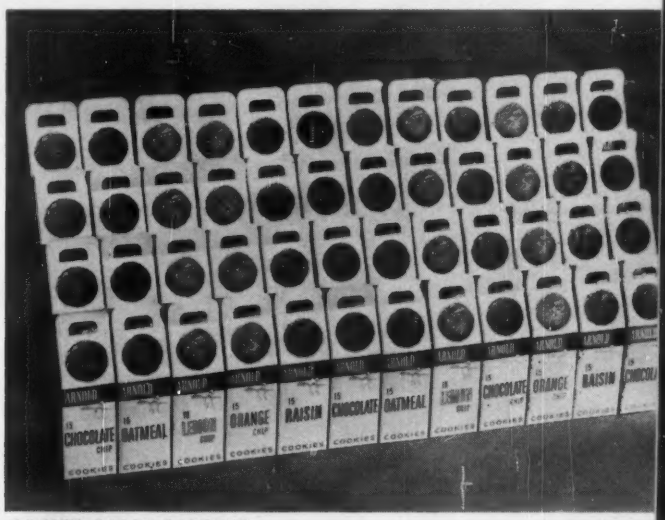
New technique for vacuum packing and sealing meat products in an air-tight, specially laminated Saran plastic film has been developed by Oscar Mayer & Co.

OM plans to introduce its line of weiners in the "Super Saran" in early '61. Package, now used for Smokie Link sausages, is said to capture and protect freshness, flavor, and color at time of manufacture.

Film, supplied by Dow Chemical Co., is contour-fitting and allows total product visibility plus convenience in opening (408).

(continued on next page)

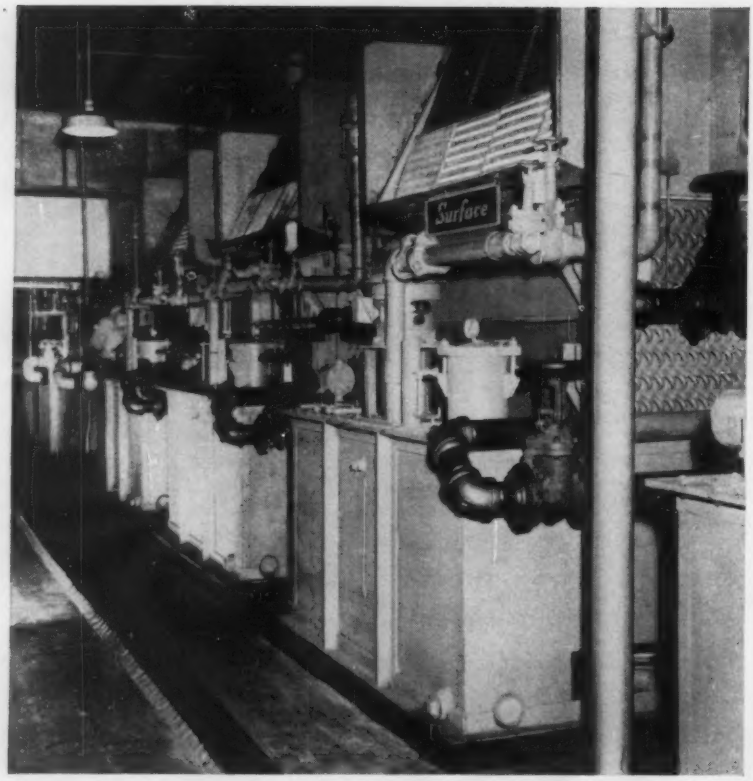
GALLON MILK CARTON



COOKIE CARRY-CARTONS

POLY-WAX BREAD PACKAGE

VACUUM-PACKED WEINERS



120 GRAINS CUT TO 45 IN 200,000 cfm OF AIR WITH 85° TOWER WATER

Without Kathabar, this job would have taken 1800 tons of refrigeration, at about 35F and reheating air from about 45F to 98F! With Kathabar the job took 63 hp instead of 2000. Ask the men who have seen Kathabar Type C units serve for years with practically no maintenance. Write for specific information.

Surface

SURFACE COMBUSTION

Division of Midland-Ross Corporation

2382 Dorr St., Toledo 1, Ohio

Send facts on Kathabar systems for the following application:

name and title.....

company.....

street.....

city.....*zone*.....*state*.....

PAK-A-PAN, a bake-in, sell-in pan package for cakes, has been developed by Marathon Div. of American Can Co. Package is a tapered foil-lined tray with raised corners and a foil-laminated center post. (410)

Packaging Briefs

Two flexible transparent films (450 T-69 and T-70) have been developed by American Viscose Corp. Durable films are special combinations of two light gauge cellulose base sheets with a thin polymer resin inner ply. (411)

Square cottage cheese jar introduced by Owens-Illinois cuts freight costs. Sixteen jars fit space required for only 9 round jars of same capacity. (412)

Break-Away poultry container from Mead Corp. has perforated width panels which can be broken into two 12-packs for shipment to dealers. Feature also eliminates strapping operation and saves on storage rates. (413)

Polygriptex, a new, improved, water-based adhesive for bonding polyethylene and polypropylene sheeting to kraft paper and burlap is announced by Adhesive Products Corp. (414)

New Product Shorts

Sprite, a new lemon-lime drink from Coca-Cola Co., is being test-marketed in Sandusky, Ohio, and Lansing, Mich.

Pops-Rite popcorn seasoning is being distributed right in cans of popping corn by Blevins Popcorn Co., Nashville, Tenn.

Meat-atic, a low-salt bacon aimed at specific diet market, has been introduced by Merkel, Inc., Jamaica, N. Y.

Hamburg patties that retain their original diameter after cooking are now being marketed by Armour & Co. under Sta-Big brand.

Mazola Margarine, containing non-hydrogenated corn oil as its major ingredient, is being introduced by Best Foods Div. of Corn Products Co. Product is priced competitively with other premium margarines.

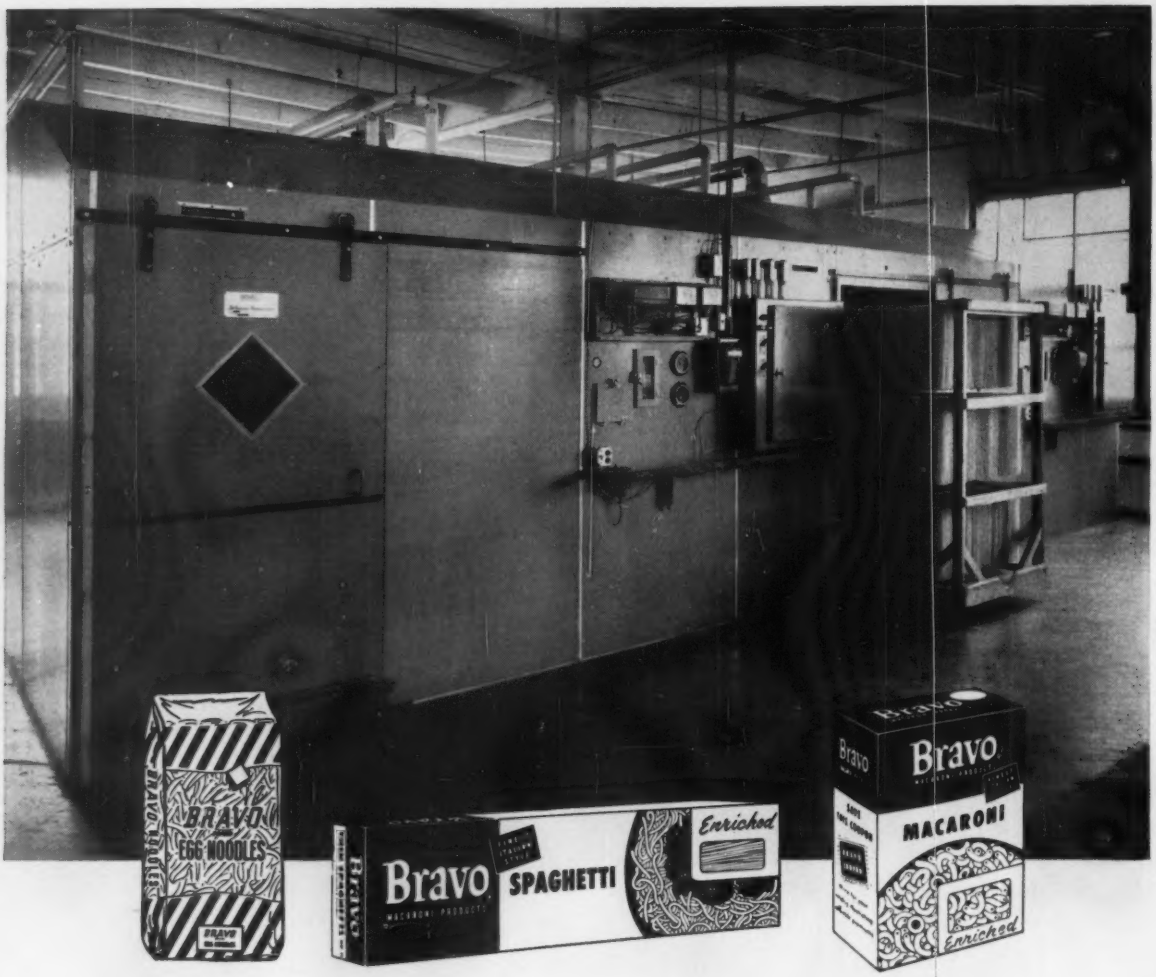
Packaging materials that protect...while they save...while they sell

Four out of five of the largest dessert mix manufacturers *regularly* use Riegel protective packaging materials. Personal experience has given them faith in Riegel's technical leadership . . . reliance on Riegel for just the right packaging for their products. Confidence like this can be found among sales leaders in many fields. Why not talk to Riegel *now*.

4 OUT OF 5 BUY Riegel

Over 600 different materials . . . standard or tailor-made . . . pouch papers, paperboards, glassines, foils, films . . . laminated in various combinations . . . plastic-coated or waxed . . . printed or plain . . . are made available by Riegel to assure you a tailor-made blending of product protection, machine efficiency, and low cost. Write Riegel Paper Corporation, 260 Madison Ave., New York 16.

CIRCLE 27 ON READER SERVICE CARD



Bravo ! It's under *Taylor* control

"It" is the DEMACO DiFrancisci Spaghetti dryer system at Alfonso Gioia and Sons, Inc., Rochester, N.Y., plant. Temperature and humidity are controlled by Taylor Instruments.

The drying time for spaghetti and macaroni products has been cut by more than 50% in recent years, thanks to the use of improved air circulation methods and precise regulation of temperature and humidity to prevent checking or color deterioration. Each of these Taylor control systems employs Wet Bulb and Dry Bulb SENSAIRE* Transmitters, a TRANSET* Computing Relay and a Pressure Regulator. The Dry Bulb Transmitter's signal actuates the Pressure Controller, which in turn regulates steam supply to control dryer temperature. Both Dry Bulb and Wet Bulb signals go to the Computing Relay, which operates a pressure switch controlling fan and louvers to maintain proper humidity.

Accuracy and dependability of the instruments is all-important in this system, since both wet and dry bulb temperatures have to be controlled within ± ½ degree F.

In addition to the very considerably reduced process time, Mr. Joseph Gioia, Vice President in charge of production, states that savings in floor space amount to approximately 60%; uniform quality is maintained automatically; spaghetti strands remain straighter; spoiled goods are unknown.

Whatever your processing control problem, remember that Taylor has had years of experience in serving the food industries. See your Taylor Field Engineer. Taylor Instrument Companies, Rochester, New York, and Toronto, Ontario.

*Trade-Mark

Taylor Instruments **MEAN ACCURACY FIRST**

Biggest Challenge—Meet Responsibility to World

Tools as simple as the scythe have alleviated hunger and starvation in backward countries of this space-conquering world.

Cooking facilities as crude as ranges made of clay have advanced the standard of living.

How much more, then, could the tremendous practical know-how of American food manufacturers do to help the underfed nations of the world!

How effectively such help would shape the minds of men to the mold of liberty and democracy! How well it could serve to defeat the Communist boast to bury us.

Bell challenges food industry to act.

It is extremely important, therefore, that leading food companies take up the challenge laid down by C. F. Bell, General Mills' dynamic young president.

At the recent annual meeting of Grocery Manufacturers of America, Mr. Bell asked the industry to help solve the world's food problems. He called this a prime responsibility of management.

More than half the world's population suffers from various degrees of undernourishment and malnutrition. And hungry people find it difficult to look at our standard of living without having in their hearts an envy that makes them the easy prey of demagogues. Help to better living through better eating will sway them in our direction, Mr. Bell so rightly argues.

To get action started, the GM executive induced GMA to authorize the organization of a food industry task force. And to this force he assigned one of his associates—full time.

It will be the function of the task force to play a vigorous and vital role in the Freedom From Hunger Campaign. Launched in July, this is a 5-year program of the Food and Agricultural Organization of the United Nations.

FAO will focus world attention on the problem of the food supply. It will try to stimulate action to meet the food crisis that confronts the world. And it will conduct its third world food survey.

Nations, civilian and business organizations, religious groups—men and women of good will everywhere—are invited to participate.

Can lead to major breakthrough.

Hopefully, FAO will be able to lay the foundation for a major breakthrough in the economic progress of underdeveloped countries.

By working with FAO, a GMA task force can be an important "board of consultants" for the UN, for our government, and for other agencies. But more importantly, it will be in a position to advise the American food industry how most effectively to play its part in the hunger war.

"Food for peace" plans of politicians are largely phonies.

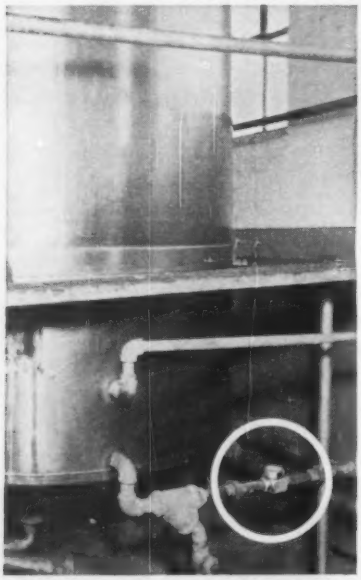
A plan formulated and backed by the food industry itself can succeed. And in succeeding, it will help to preserve the freedom without which our great industry could not exist.

SARCO TOPICS

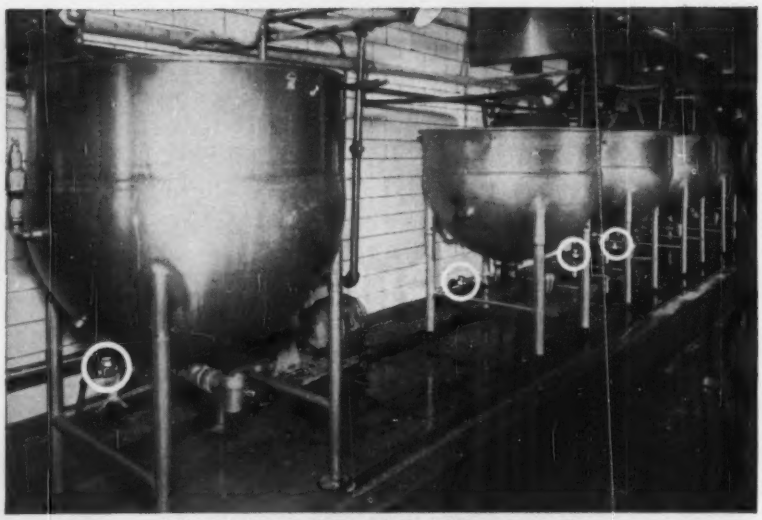
How to reduce cooking time and trap maintenance in kettles and holding tanks

College Inn Food Products Corp. of Chicago faced a problem familiar to many food processors: excessive heat-up time for kettles and holding tanks, and time lost for steam trap maintenance. They found old-fashioned bucket traps at the root of this costly problem.

Specifically, College Inn wanted to shorten both cooking and recovery time in their 150-gallon jacketed kettles... cut heat-up time for both the kettles and their 1000-gallon holding tanks... materially reduce down-time for trap repairs or replacement.



Heat-up time on storage tanks like this one has been reduced approximately 20%. The 1" TD-50 trap on this application replaced a 1½" bucket trap.



With TD-50 traps installed on these kettle rows, down-time for trap maintenance is virtually nil — over years of service.

These problems were solved by installation of Sarco Thermo-Dynamic Steam Traps, Type TD-50 to replace bucket traps. On slow cook kettles the ½" size was installed; on fast cook kettles, the ¾" size; 1" traps went on the 1000-gallon storage tanks.

Results were evident at once: Heat-up and cooking time was reduced on all kettles. Where each kettle row had previously required two or three hours per week of shutdown for bucket trap service, maintenance has now dropped to practically zero. Some traps have been in constant service for three years without attention. These results, though noteworthy, are typical. They were achieved because the TD-50 always discharges condensate as rapidly as it is formed; it cannot collect and slow down schedules.

Plant Engineer John Maurisak says: "I'm happy because of freedom from trap maintenance problems, and the cooks are happy because of the fast recovery of the kettles."

Other food processing problems will yield to Sarco TD-50's too. Where slugs of condensate and wet steam disturb processing, the TD-50 can be used to control moisture content automatically, easily. Kettle cold-spots caused by a faulty trapping system which does not discharge condensate and air adequately, can be cleared up easily with TD-50's. Other advantages include simplified piping, saved space (because TD-50's are much smaller than conventional traps), easily maintained cleanliness of surroundings.

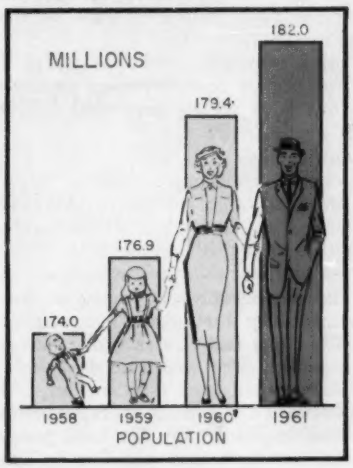
For information on Sarco Thermo-Dynamic Steam Traps, Type TD-50, contact your Sarco Sales Representative, district office, or distributor, or write.

4189

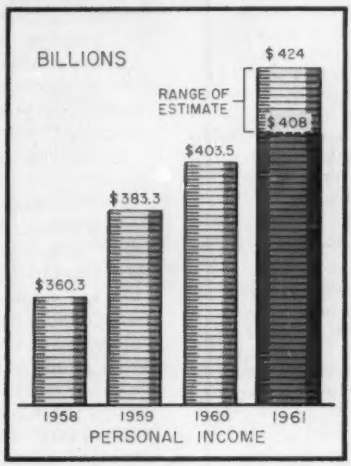
SARCO

SARCO COMPANY, INC.
635 MADISON AVENUE, NEW YORK 22, N. Y.
PLANT: BETHLEHEM, PA.
STEAM TRAPS • TEMPERATURE CONTROLLERS
STRAINERS • HEATING SPECIALTIES

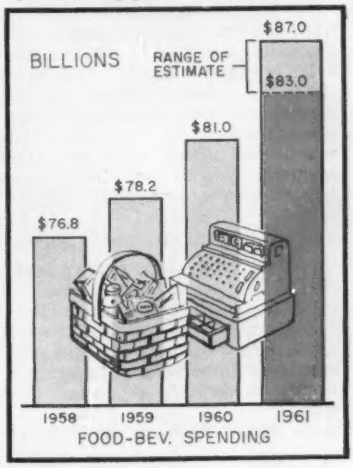
More Customers . . .



With More Cash . . .



Spells Bigger Market



...1961...

Food Boom Rolls On

Industry economists see consumers spending 2 to 7% more on food and beverages next year. Point to rising population, personal income as growth-props. Price boosts likely to offset uptrending costs

KEY SIGNPOSTS point to record-breaking consumer spending for food and beverages in 1961. That's the advice being given by leading industry economists to chief executives as their companies finalize plans for next year.

Polled by FOOD Engineering last month, industry analysts forecasted that consumer food and beverage outlays would top 1960 by anywhere from 2% to 7%. Significantly, government experts echoed the same optimism at USDA's annual Outlook Conference last month (see p. 32).

If the economists' predictions come true, 1961 will be the 12th consecutive year consumers hefted their food-beverage spending. This year's outlay is expected to be around $81 billion when final returns are in. A 2% to 7% uptrend would mean a market ranging from $83 billion to $87 billion—less $9-10 billion for alcoholic beverages.

THAYER C. TAYLOR, Associate Editor, "Food Engineering"

People and Purses

Sparking the upsurge in food-beverage sales, according to company analysts, are these two key factors which always influence food spending:

► **Population growth—which means more consumers.** Most forecasts assume that population will edge up from an estimated 179.4-million to

How Industry Branches Will Make Out

At last month's important Outlook Conference, USDA experts drew this broad picture of food industry prospects: Supplies in '61 will be "a little larger." Retail prices will "average close to those of this year," although marketing charges will be up slightly. With personal income "expected to continue high," consumer demand for food will "remain strong." Of course, the picture is not the same for all industry segments. Here's how USDA experts pinpoint the critical supply-demand-price relationship for each sector:

MEAT Larger cattle slaughter and pick-up in hog production (in the second half) to lift per capita meat consumption to a new high—165 lb. vs. 161 lb. this year. Retail prices: About the same, with lower beef averages offsetting higher pork averages. Imports, used mostly by processors, will decline as domestic production of lower beef grades rises.

DAIRY Supplies at record highs, but commercial demand won't increase as fast as population. Prices: Higher through March, when new support levels are posted. Long-term consumption downtrend will continue for butter, evaporated milk, and fluid cream. But non- and low-fat items will maintain steady growth. Per capita intake: Down from 670 lb. to 660 lb.

BAKING Record holdings of wheat will be available, far outstripping industrial demand. Retail prices: Nudged upwards by mounting processing and marketing costs. Consumption of wheat-using foods near '60 levels—165 lb. per person (grain equivalent).

CANNING FREEZING Inventories of canned vegetables down slightly, and consumption to hold at '60 levels (45 lb. per person). Stocks of the frozen variety at least as large as this year, which may lift per capita consumption to record 10 lb. (vs. 9.3 lb. in '60). Increased processing and distributing costs will push up prices of processed vegetables. Supplies of canned fruits will be large, and consumption will remain at around 23 lb. Frozen fruits will be plentiful, but juice concentrates down slightly. Retail prices will trend up somewhat. Exports should continue to gain as more countries ease their trade barriers.

POULTRY Broilers and turkeys will be more plentiful, and at lower prices. Production will be spurred by highly-organized firms interested in minimizing operating costs through capacity operation, improved production techniques, and possibly lower feed prices. Exports, which now take more than 2% of US production, to rise sharply.

FATS, OILS Output close to peak highs. Prices: Soybean oil up 15-20%, meal off 5-10%, on the basis of smaller carry-overs. Lard production to decline, reflecting reduced hog slaughtering, and prices will advance slightly. Heavy exports will strongly influence the price food manufacturers pay for primary fats and oils. Margarine usage up once again.

at least 182.0-million between '60 and '61—a 1.5% rise.

► **Rising personal income—hence more money to spend at supermarket check-out counters.** Personal Income is expected to settle around $402-$404 billion (annual rate) when final '60 results are in. Food company economists figure it will move up again in '61—to anywhere from $408 billion to $424 billion. The average estimate: $417.6 billion.

There's also a third economic indicator which is a favorable omen for bigger food-beverage expenditures next year—that is, a widely-predicted fall-off in sales of durable goods in '61.

Here, the reasoning goes this way: Stepped-up spending on big ticket items (such as autos, refrigerators, washers) does an effective job in thinning-out consumer wallets. Also, such items often involve time payments—which take big chunks out of the weekly paycheck, leaving less for family basics.

If you look at the comparative behavior of food and durable goods spending during the '50s, you can see how food benefits from fall-offs in purchases of hard goods (chart p. 33). For example, during the years in which consumers cut back on durables, they upped their food-beverage outlays an average 4.86%. Conversely, when they laid out more for hard goods, they increased their food-beverage spending by only 2.45%—far below the 4.13% which was the average year-to-year gain for food-beverage during the whole decade.

Not All Gravy

Of course, the looked-for 2 to 7% hike in food-beverage spending doesn't mean that tonnage will move up that fast. Part of the gain will result from higher prices brought about by rising costs.

Thus, one food company economist told FE that bigger dollar sales will be fueled by an "increase of 2.0 to 2.5% in retail prices." A second analyst opined that "when demand picks up, we can expect rapid increases as firms attempt to restore presently narrowed profit margins."

Not all of the analysts expect higher prices. As witness this contention: "Prospects for abundant supplies suggest that food prices will probably not go up, and I doubt if there will be much change in industry profit margins."

Three specific areas where higher costs seem likely are: Labor, packaging, and some raw commodities (especially on the West Coast where higher picking fees will be passed on to the processors).

This year, hourly wage rates in food plants rose 4%. For '61, the Labor Dept., foresees pay scales in manufacturing industries edging up 2-2½%, but adds that greater productivity will partially offset the rise.

One development to watch, though, will be the formation of the new industrial council, within the AFL-CIO, made up of unions in the food-beverage industry. The group is sure to try to lift food pay scales closer to the level of other higher-paying industries.

In the packaging field, at least one big can-maker sees the possibility of a 2-5% rise in the price of tins because of higher pay rates. A second big firm is telling customers that "1961 prices will be slightly higher in line with higher costs." Adds the company: "The prices named will be firm except for increases in tinplate price or freight rates." And, since tinplate prices set the tone for aluminum, you

can expect the light metal to follow any uptrend that takes place.

Obviously, the key to watch here is the pay increase that goes into effect for steelworkers this month. In the past, pay hikes have always been followed by higher tinplate prices.

On the whole, USDA sees no large changes for the year ahead in the prices of supplies and equipment bought by food makers. But slightly higher transportation rates are likely, it says.

Smiles Upstairs

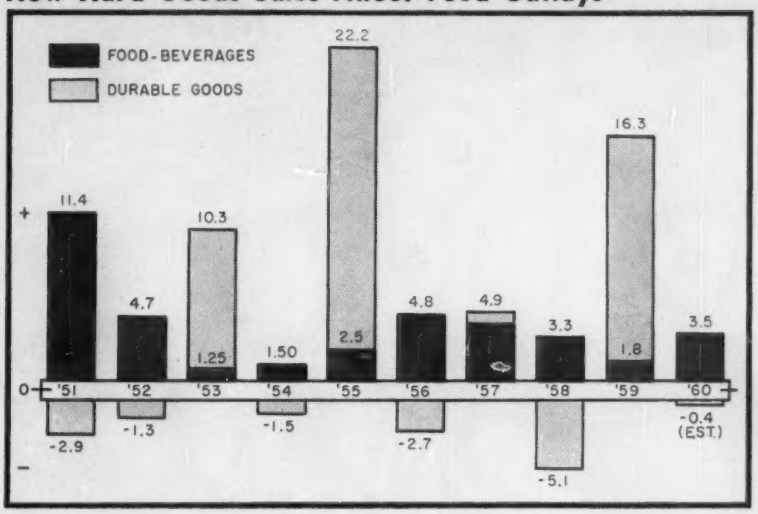
The economists' optimism is shared by the top echelon of food company management. To get a further fix on 1961 prospects, FE checked with food-beverage chiefs who took part in the recent hush-hush meeting of the Business Advisory Council. The BAC, made up of the country's top business executives, meets periodically to advise the US Commerce Dept. on how members view the present and future business climate.

One food chief who took part in the sessions summarized his outlook thusly: "Coming year should be a relatively good one for our industry. Even a moderate slackening of general industrial activity—as predicted by many economists—does not seem to threaten this prospect.

"Consumers may defer many purchases during periods of business uncertainty, but their food buying patterns do not change rapidly. It is noteworthy that total food expenditures continued upward both in '54 and '58, the years that marked the last two business dips. The steadiness of consumer demand is, of course, reflected at the manufacturing level, since inventory swings in processed food products are not large."

A second top industry executive came away from the meeting more optimistic than he was at the start.

How Hard Goods Sales Affect Food Outlays



Said he: "I would expect the food-beverage industry to fare about as well in '61 as it has in '60. Any significant change that does take place on the consumer level I would expect to be upward, but the degree of increase will probably prove to be very moderate."

Asked to pinpoint their predictions, the executives responded this way: One felt that "we have a right to expect at least a 5% gain in food-beverage consumer expenditures." A second less-optimistic company head stated that "our best estimate is for a rise around 1.5 or 2.0%. This would be a little less than the increase being reported for the current year since it assumes less growth in the disposable income category."

The executives stressed that not all industry sectors would share equally in the looked-for dollar increase. As one company chief shrewdly noted: **"There will continue to be wide differences in growth between different product groups, with newer convenience foods showing much more dramatic gains."** (End)

Sales, Profits Top '59 Rate For First Nine Months

	9 Mos., '60 vs. '59		Net-as-share-of-sales	
	Sales	Earnings	'60	'59
Dairy	+5.0%	+2.1%	2.7%	2.8%
Packaged Foods	+5.3	+8.2	6.1	5.9
Canners, Freezers	+12.0	+15.2	2.7	2.6
Baking	+4.9	+6.6	3.7	3.6
Brewing	+4.0	+6.4	4.3	4.2
INDUSTRY*	+5.7	+6.8	4.0	3.9

** For 32 firms who report sales and profits quarterly. If you include 19 others who report earnings only, profits increased 5.5%.*

FOOD FIRMS showed a strong profit upsurge over year-ago levels as they rounded the third-quarter mark of '60, an FE check of financial reports showed.

At the end of the first 9 mos., 32 outfits posted 6.8% fatter profits, 5.7% bigger sales than in '59.

Even more significantly, the critical profit-as-share-of-sales ratio trended upwards—from 3.9% in '59 to 4.0% in '60. This key figure was improved in all sectors but the dairy field, where sales gained twice as fast as earnings.

The 9-mos. results were somewhat shaded by a 3rd quarter slowdown. For example, unseasonable weather affected earnings of brewers, down 1.4%, and soft drink bottlers, down 2.9%. And competitive pricing squeezed dairy profits, down 1.8%.

Companies in the canned-frozen and packaged foods fields paced the industry's upward climb. Canners and freezers entered the final 3-mos. stretch riding 12% bigger sales and 15.2% heftier profits than a year ago. And packaged food makers faced the year-end encouraged by a 5.3% bulge in sales, and an 8.2% improvement in earnings.

TOP-NOTCH SPECIALISTS in every phase of production serve as instructors at the Pepsi schools. Everything from premix to the final package is discussed and analyzed by the instructor and the class, itself, in program to boost bottling efficiency.

Production Schools Keep

Program of education helps franchised bottlers keep pace with latest developments in equipment and production techniques. Actual schools and clinics are tools of training

MARKETING & TECHNOLOGY go hand-in-hand at the Pepsi Cola Co. And this "togetherness" is resulting in rapidly rising sales for the worldwide soft drink firm.

Organization is based on the simple fact that Pepsi Cola is actually a collection of franchised bottlers. And these bottlers must be aided in selling their product via the parent company's talent and money. This marketing aid is carried out in the most part through advertising, as is evidenced by the $32 million spent in '60 by the Marketing Div. for various media.

But Pepsi goes even further than that. It gets right down to the franchise plant level and helps sell by teaching better management and production techniques.

JACK L. MISCHOU
Assistant Editor, "Food Engineering"

Training is of prime importance to Pepsi's management — a management that has seen domestic case sales of Pepsi climb almost 190% since '50.

This rapid rise has been triggered by reorganization of company and product. But investment in new equipment is a large part of the success story. During '60, Pepsi bottlers will spend over $20 million for new plants and equipment across the nation, bringing the 10-yr. spending figure to nearly $120 million. In the first 6 mo. of this year, equipment purchases alone have increased the productive capacity of Pepsi plants by 29,000,000 cases annually.

Charged with the responsibility of helping bottlers make these expenditures worthwhile is the Technical Services Dept. Though handling product control, plant design, and engineering services, this active department is still a part of Pepsi's overall Marketing Div.

From his 14th floor office at Pepsi's new Park Ave. headquarters in N.Y.C., Technical Services V.-P. Stephen J. Gullo heads up an education program that gets the most out of dollars spent. The 20-yr. soft drink industry veteran and a staff of 15 organize production "schools" and clinics throughout the country to assist bottlers in various phases of production.

First part of these training operations is the production clinic. Held in conjunction with equipment suppliers, these sessions get right down to the nuts and bolts of handling new machinery and supplies for maximum efficiency. Day-to-day operation and maintenance is stressed by representatives of Pepsi and firms like George J. Meyer Co., manufacturer of a wide line of bottling equipment.

NUTS AND BOLTS production techniques comprise the curriculum at schools and clinics. At left, students look over some new pieces of equipment to be discussed during class sessions. At right, class of plant managers and supervisors focus attention on a speaker during a typical school day.

Pepsi Bottlers 'In the Know'

Thus, when new equipment is bought by a Pepsi bottler, he is also taught the right way to run it. Considering the rapid improvements in bottling machinery, such as 24-spout fillers that handle 400-500 bottles/min., instruction is vital.

Insures Proper Handling

The success of these clinics is evidenced by the upcoming schedule which includes sessions with Mojonnier Bros.; Crown, Cork and Seal; RCA; and other suppliers. Each clinic will be geared to proper use and maintenance of equipment from these firms, which also realize that well-trained users of their equipment are their best advertisement.

Clinics have been held in Chicago, Raleigh, N. C., Fresno, Calif., Montreal, and New Orleans. Participants for these sessions total 138 from 86 cities and 29 states.

But most of the franchise bottler training comes from production schools. According to V.-P. Gullo, "These meetings are designed to help plant personnel keep pace with overall Pepsi expansion and with the latest production and quality control methods."

Schools are four days in duration and are strategically located around the country for maximum coverage. A maximum enrollment of 35 students is usually maintained for the sessions, which include full 8½ to 9-hr. days of class. The "faculty" is composed of top-flight personnel in the Pepsi organization. An extensive curriculum runs the gamut of production and each discussion is led by an expert in a particular phase of operation.

For example, at the recent production school held in Atlantic City, Pepsi called on its v.-p. of plant design, Neil Morrison, to lead the discussion on refrigeration. Vital aspects of proper design, use, and maintenance were illustrated via charts and case histories. For answers to particular questions, the students had a qualified expert right on hand with the answer. Men like Thomas Gillespie, manager of fountain syrup sales for Pepsi's Eastern Div., and Lon England, manager of the Packaging Div., presented the latest developments and techniques in their areas of production.

Other areas coming in for critical analysis and study included water treatment, crowns, bottles, bottle inspection, syrup room practices, bottle breakage, bottle washing, carbonation, filling, case cleaning, sugar, cartons, vendor cleaning, truck marking, and premix. Placed strategically around the meeting room were graphic displays of each subject—the proper way to handle each operation.

Daily Exams, Too

At the end of each day's session, examinations are given to participants. Grades are given and prizes are awarded to those receiving the highest grades. During the banquet closing out the school's end, a special prize is given to the student with the highest average. Top officials from Pepsi are always on hand to award "diplomas" or accomplishment certificates to school graduates.

Pepsi moves 1½ tons of equipment into the hotel or auditorium where a school is to be held. Each school costs Pepsi about $5,000.

The franchise bottler pays expenses for transportation, hotel, and meals. Program is strictly voluntary and a bottler may send whomever he wishes to the school. In most cases, it's the No. 2 man or plant superintendent who attends, but often the top man from a particular plant will also be pres-

Displays Emphasize Need for Production Know-How

COLORFUL ILLUSTRATIONS of curriculum topics like these back up Pepsi school presentations and impress students with the importance of efficiency in all areas of production.

ent. In fact, of the 377 participants in past schools, 75 were owners, the rest production supervisors.

Pepsi has completed 11 schools covering the country from Long Island City, N.Y., to San Francisco, and from Dallas to Atlanta. In all, 242 cities from 43 states have been represented. Diplomas have been given to 377 production chiefs, and 106 more bottlers have covered the sessions as observers.

Benefits derived from the schools are many. "It's essentially a training program to create an awareness of the need for understanding various production problems. It introduces management into the production end of the business," explains Gullo.

He points up three benefits that are most significant:

► Better utilization of manpower.
► Improved plant efficiency in general.
► Modernized record-keeping for top-notch quality control.

And, most important, the schools attempt to teach bottlers how to interpret records for maximum efficiency and performance. The knowledge of the latest in equipment use is joined by the ability to understand and interpret proper records of quality control.

Significant to William Labian, manager of engineering services in the Technical Services Dept., are the really practical benefits obtained from the education program. Problem-solving is a tool that is used regularly. And these problems are not just hypothetical. "In many instances," explains Labian, "a supervisor will come to one of the schools with a particular problem in mind. For example, his plant may be faced with excessive bottle breakage. The problem is thrown open for discussion by both the class and instructor. The supervisor can usually count on going back to his plant with the right solution."

No Lethargy Here

Unlike many training programs and seminars that turn out to be time-wasters and bull sessions, Pepsi's production schools register very well with the students. "The reason for this constant interest is the subject matter of the curriculum," notes Gullo. "It's stuff the men understand. They've been familiar with it on the job and have seen production problems that will regularly crop up. In these schools, they learn a little more about the right method of running a bottling plant."

Take George Nicholas, assistant plant mgr. of the Pepsi Cola Bottling Co. of Pennsauken, N. J. Says Nicholas, "There are many things that we might do 1,000 times a week that, with a slight modification, could have been done easier and more efficiently. At school, these situations are brought home to us. Naturally, when we return to our plants, our production benefits."

He adds, "The sessions also help us to learn about new developments in the industry. Take liquid sugar, for instance. We haven't been using it in our plant, but plan to introduce it in the near future. When that time comes, I'll know a heck of a lot more about its use and can be of considerable help in its installation and operation. That was one of the subjects covered at the school."

"It seems that there's an answer to be found for every problem at the school," he continues. "If the discussion leader doesn't know it, there's always somebody in the class who does. And we can interrupt the speaker anytime to clear up a problem."

Pepsi gets maximum publicity on the local level from these schools. Press releases are sent out at the beginning and end of each school, pointing up its purpose along with pertinent facts about Pepsi. Then, too, releases go out on each individual who attends. If he wins a prize, this news is also released to the local press.

According to Gullo, this publicity acts two ways, "First, it provides publicity for Pepsi Cola in general. And, secondly, it helps make the local operators better known in their respective communities."

Since '52, Pepsi Cola has opened more than 170 new plants domestically as well as 139 overseas. Today, in the U.S., there are 530 franchised bottlers, plus 20 more plants of the Pepsi Cola Metropolitan Bottling Co., a subsidiary of the parent firm.

The increase in actual plants and the introduction of new equipment as time goes on dictates the need for keeping up with technological developments in the soft drink industry. To do this, Pepsi is planning an accelerated program for '61 with additional schools, clinics, new programs and presentations, and increased active participation on the part of Pepsi "students."

(End)

CAMPAIGN COMMITTEE worked up the waste control program and planned it to sustain interest and cooperation of all employees.

Reduce Plant Waste by Campaign

Get a concentrated waste-control campaign going with all possible promotional trimmings. Then keep up the fanfare as did Miller Brewing

IF PLANT WASTE PROBLEMS plague you, take a look at Miller Brewing Co's. new Campaign on Waste. The campaign was designed to arouse and sustain personnel interest in stemming material waste. It was planned to last three months—on the theory that by the end of that time high level interest in material waste control would become an employee habit. And that is precisely what happened.

► **Origin.** The idea came when management decided to make its employees conscious of the importance of waste to business and thereby make them more conservative. People, management reasoned, are naturally careless—if not about one thing, then about another.

JOHN V. ZIEMBA
Senior Associate Editor, "Food Engineering"

Waste is an indirect expense which, while not directly charged to workers, increases production costs. Some plants mistakenly consider material waste too small an item to fuss about, and emphasize cutting both direct labor and material costs. But the pressure on waste losses is rising. That's why Miller is so concerned about it and is taking effective remedial action right now.

At the time management came up with this idea, the level of plant waste control was about average. Nothing to be ashamed of, but not nearly as good as it should be. What with the company putting money and effort into improving production efficiency and into modernizing, it seemed an excellent time to get employees to increase their efforts toward stemming waste.

► **Campaign objectives.** Higher productivity and fewer rejects (without additional time or effort) — due to dollar savings through fewer material losses. A safer plant—due to reduction of such hazards as broken bottles, spilled beer in bottle shop, cases toppling off jammed-up conveyors or improperly stacked loads in warehouse. Also, Miller looked for ways of properly handling materials — an area involving much of the unnecessary material losses. Rough or indifferent loading, stacking, storing and movement of cartons not only create a safety hazard, but also substantially contribute to annual losses.

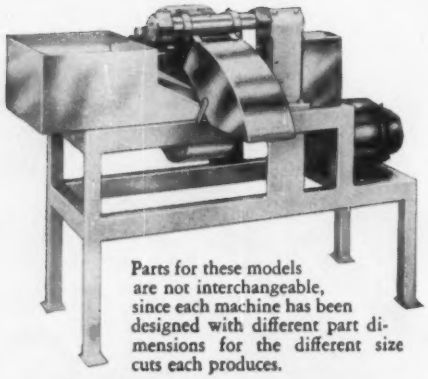
Sometimes materials aren't used for intended purposes. So employees were instructed not to use cartons for chairs, windbreaks or floor mats, and to store brushes, shop towels, etc.

Housekeeping rules are not al-

URSCHEL

Models F, G, H *and* GK ... *are* 4 *Separate Cutting Units!*

They all look alike...all operate alike



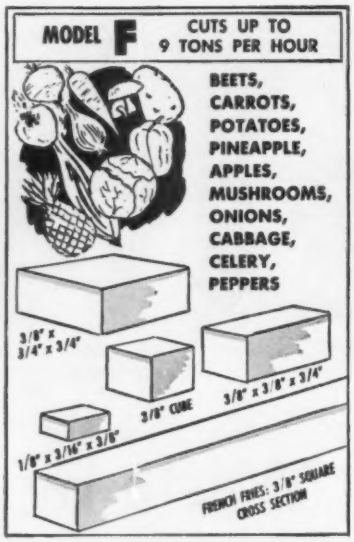
Parts for these models are not interchangeable, since each machine has been designed with different part dimensions for the different size cuts each produces.

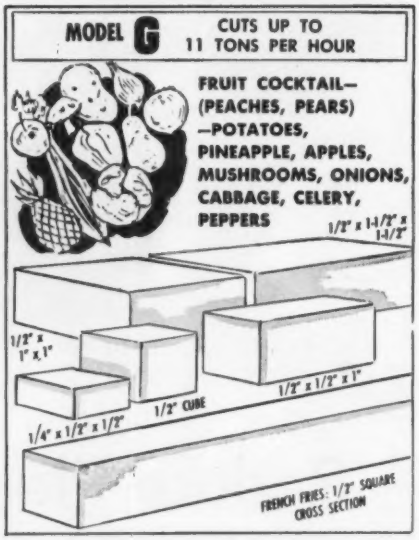
...but each produces a different range of cut sizes!

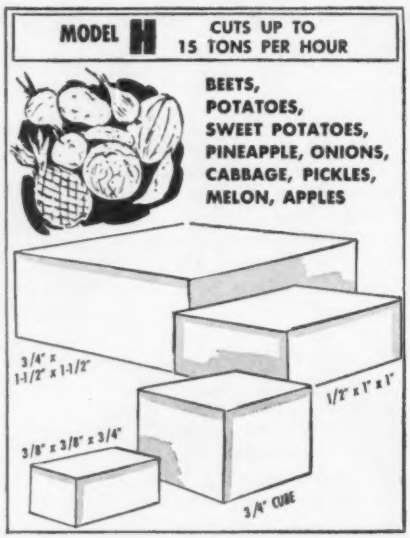
The product to be diced is fed first to the inside of a slicing shell, where it is then rotated by an impeller at high speed. Centrifugal force causes product to slide around the inside surface of slicing shell. As product approaches top of this shell it slides over an adjustable slicing gate which controls slice thickness. Slicing knife is at top of slicing shell. At the instant of slice, cross cut knives ride down, cutting slice crosswise into strips, or french fry cuts. These knives throw the product into the revolving circular knives that cut the strips into cubes.

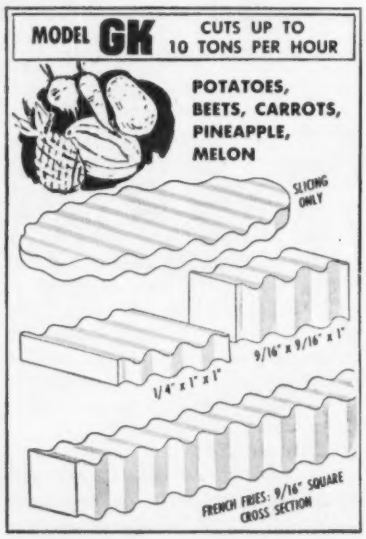
This new cutting principle has many advantages over previous methods. When slicing any product with a knife, the product tends to crack parallel with the knife's edge, particularly in brittle, root vegetables. Product cracking is overcome by cutting parallel with the strains set up, thus eliminating strains and the resultanc cracking.

Product damage is eliminated by moving the product in a straight line from the time the first cut is made until the last cut is made, which reduces impact and crushing, and makes possible the high operating speed and quality of cut produced.


MODEL F
CUTS UP TO 9 TONS PER HOUR
BEETS, CARROTS, POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
3/8" x 3/4" x 3/4"
3/8" CUBE
3/8" x 3/8" x 3/4"
1/8" x 3/16" x 3/8"
FRENCH FRIES: 3/8" SQUARE CROSS SECTION


MODEL G
CUTS UP TO 11 TONS PER HOUR
FRUIT COCKTAIL—(PEACHES, PEARS) —POTATOES, PINEAPPLE, APPLES, MUSHROOMS, ONIONS, CABBAGE, CELERY, PEPPERS
1/2" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
1/2" CUBE
1/2" x 1/2" x 1"
1/4" x 1/2" x 1/2"
FRENCH FRIES: 1/2" SQUARE CROSS SECTION


MODEL H
CUTS UP TO 15 TONS PER HOUR
BEETS, POTATOES, SWEET POTATOES, PINEAPPLE, ONIONS, CABBAGE, PICKLES, MELON, APPLES
3/4" x 1-1/2" x 1-1/2"
1/2" x 1" x 1"
3/8" x 3/8" x 3/4"
3/4" CUBE


MODEL GK
CUTS UP TO 10 TONS PER HOUR
POTATOES, BEETS, CARROTS, PINEAPPLE, MELON
SLICING ONLY
9/16" x 9/16" x 1"
1/4" x 1" x 1"
FRENCH FRIES: 9/16" SQUARE CROSS SECTION

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products

ways followed. Through careless use of hoses, mops and brooms, many cartons are damaged to the extent that they can't be used for their intended purpose.

Lack of economical foresight often results in waste losses. Example: One of the most frequent lost time-and-material incidents is a conveyor jam-up. Best practice is to prevent one and, if one occurs, to clear it up rather than wait for someone who's closer to do it.

► **Good timing.** Running a campaign meant asking the employees to make a special effort. It was planned well in advance to cover a concentrated 3-month period within the peak production season (summer months).

► **Good organization.** The committee for Campaign on Waste includes key personnel from production, engineering, industrial relations, finance & accounting departments, with C. G. Meyn, associate brewmaster and plant manager, as chairman. Since plenty of good publicity is an important factor in running a successful campaign, the national advertising manager and publicity supervisor were named to the 8-man committee.

At the peak of its activities, the committee conducted weekly meetings, then bimonthly ones. After the campaign got rolling, the committee coordinated activities and the necessary follow-through.

► **Good promotion.** Program had the campaign theme tied-in with country's past political campaign. At first glance, any relationship between Miller's Campaign on Waste and the company's business of advertising and promotion seems downright fanciful. It would appear that such a campaign primarily benefits production, since this is where most waste occurs.

Much of Miller's success therefore, is credited to planned promotion, which gave the campaign some shots in the arm. That way —and with the promotional drums beating—Miller's 2,500 employees (office and production) were kept up on the many "little" ways of savings materials. They were told that no matter how small the economy, the combined efforts of all add up to offset the increasingly high cost of doing business.

Campaign's been given a big boom from a small beginning. It was carefully thought out, carefully planned and organized at the start of the year. It was supplemented with all the promotional fanfare to make all personnel continuously waste-conscious.

First Announcement

First news of the campaign was a letter from president Norman R. Klug. Letter was published in the house organ, *Miller High Life Highlights*. Appearing, at the same time, was a feature story on waste control in the company magazine.

Here's a key portion of president Klug's letter:

"While it is a relatively simple matter to check allocation of funds for advertising, merchandising, research and development, and technical improvements, it (reducing waste) demands an all-out, individual effort to check excessive waste of time and materials—those things which raise the cost of producing Miller High Life and lowering job security.

"The essential ingredients for any company's growth and security for its employees are quality production, sales and COST CONTROL. With this thought in mind, we are requesting the aid of each Miller man and woman in the forthcoming company-wide 'Campaign on Waste.' This campaign should help all of us to become more alert in the area of reducing waste and should serve to remind us that our individual efforts are most important."

Company magazine highlighted over a dozen illustrations pointing to key areas of waste. Illustrations featured a single caption: "Let's not produce waste... just the finest beer." Other waste control stories were timed for remaining summer months' issues.

Magazine's text pointed to the necessary marriage of wages and profits—that wages are paid from profits. Higher wages won't increase profits nor increase job security afforded by profits. Higher profits, conversely, can increase wages and job security. Only avenue for company growth, higher profits and job security, is the most production at least possible cost. To travel this road requires individual effort (as pointed out in Klug's letter) on the part of everyone to eliminate waste.

Campaign Is Well Organized

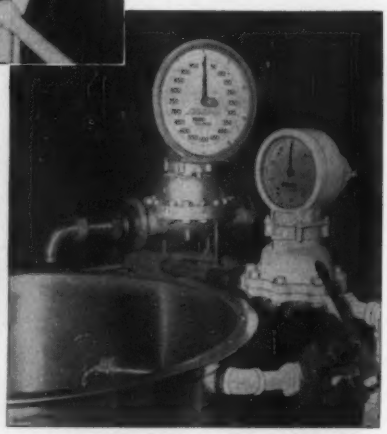
Campaign's organizers proceeded cautiously, made sure the program was properly presented so

Every Batch of Old Dutch Salad Dressing the Same — in Consistency and Taste

Niagara Displacement Meters insure CONTINUOUS QUALITY

Ingredients of each batch are run in quickly . . . accurately with Niagara Meters in the Old Dutch, Inc. Plant, Blasdell, New York.

Close-up of Niagara Meters showing large vertical registers with easy to read figures for accurate measurement.



Old Dutch Salad Dressing has won wide acceptance for its palate-pleasing piquancy. Safeguarding the ability to maintain this flavor acceptance are two Niagara Displacement Meters, one for measuring the oil and the other the dressing mixture.

Prior to the installation of these Niagara Meters, it was necessary to completely remove all salad dressing from the premix tank before starting another batch. This was necessary because ingredients were measured by the dip stick method.

Now, correct amounts are metered to the tanks by the Niagara Meters regardless of amount of salad dressing left in the tank from previous batch. Result: Faster, accurate preparation of each batch for uniform quality and lower costs.

Let us show you how Niagara Meters can reduce *your* formulating costs. Mail coupon today.

BUFFALO METER COMPANY, Inc.
2910 Main Street, Buffalo 14, N. Y.

☐ Please send me additional information on Niagara Meters.
☐ Please have representative call.

NAME_____

ADDRESS_____

CITY and STATE_____

BUFFALO METER COMPANY
INCORPORATED
2910 Main Street • Buffalo 14, New York

it wouldn't buck resentments but would get the full cooperation of all employees. Stressed was the fact that being waste-conscious didn't cost personnel any money, didn't require any additional time or effort on their part.

Original thought was to sustain interest through a poster-type campaign which, in itself, wouldn't do the job. Developed, then, was the concentrated promotional campaign that's been built up to fever pitch.

Taking a page from the company's advertising campaigns, the short-term waste control program's every bit as spectacular and concentrated. Build-up in promotion was planned in stages to employ every possible means of getting waste control messages to employees.

Scheduled, then, was the use of all media to hit employees again and again with every means at the company's disposal. Promotions kept selling waste consciousness to employees just like Miller High Life's sold to the public.

Promotions were kept humming with a steady flow of a variety of pay-envelope stuffers (bi-monthly), bulletin-board posters (weekly), 3x6-ft. banners (monthly) in high traffic areas, tent cards (every other week) in lunch rooms and office-areas desks.

Pay-Off Today

. . . Results to date have greatly exceeded Miller's fondest expectations. Employee interest was greatly aroused and sustained by frequent promotional changes. A good indication of interest has been the large number of voluntary suggestions to foremen about conditions that lead to better methods of controlling waste. Suggestions included better ways of handling product and packaging materials, handling packaged products and similar ideas.

. . . Everybody keeps trying. Departments that found they've wasted much materials make extra efforts to cut these losses.

. . . Work quality has improved, and there's an improvement in working conditions.

. . . Cost? not much considering the benefits. Monthly expenses are minor, covering promotional pieces and printing. No attempt has been made to compute cost and material savings. But management is satisfied that all the cost is being returned many times.

(End)

Nitrogen Gases Stop Flavor Fade

Minute Maid uses nitrogen to sparge oxygen from product during processing. Vitagen gas mixture put to same purpose by others

THERE'S NO FLAVOR FADE in frozen concentrated orange juice produced by Minute Maid. Nor does a cardboard flavor develop over long periods of storage. Consumer panel tests have demonstrated the excellent flavor-retention properties of the juice.

The improvement results from use of nitrogen to replace air in the juice and to blanket it in certain processing operations. It is necessary to handle only the add-back single strength juice in this manner, because flavor of the concentrate comes from the add-back. At any rate, vacuum evaporation removes air from the concentrate.

Nitrogen is introduced at the bottom of a sparging column some 24 in. in diameter and 18 or 20 ft. tall. Flowing as a gas from a tank of liquid nitrogen, sparging gas passes through a diffuser nozzle at bottom of column. Finely dispersed bubbles of nitrogen rise up through the juice in counter-current flow to displace the dissolved oxygen and force it through a vent at top of column. This technique will reduce the oxygen content to 0.01 ml. per 1,000 gm. of juice.

Sparging is done after extraction, finishing, and pulp washing operations. And from then on tanks or process vessels through which juice passes are nitrogen blanketed to maintain an inert atmosphere.

The protective gas is not used, however, to fill the headspace in the cans. This is a controversial point, some arguing that still further improvement could be achieved by a nitrogen pack.

One processor of chilled orange juice uses nitrogen sparging to replace oxygen in the product and ships in tank trucks under a blanket of nitrogen.

Nitrogen is protecting the quality of wine in the West Coast wine industry through controlled fermentation, and it is guarding mayonnaise, salad dressings, ice cream, and peanut butter by replacing air in "fluffing" these products.

Sparging of dissolved oxygen with nitrogen is based upon the principle that a gas added in larger quantities will displace a dissolved gas present in lesser amount.

Vitagen Used, Too

Vitagen gas, produced by Vitagen Corp., Los Angeles, Calif., is also being used to strip air from orange juice in one Florida plant. Costing only 5 to 10 c. per 100 cu. ft., the gas is used, too, as a protector of cottonseed oil and liquid coffee concentrate.

Approved for use in food processing by the FDA, Vitagen is a mixture of gases which achieves its protective effects in ways that vary from the oxygen chasing and excluding actions of nitrogen. But Vitagen claims only that the gas is inert and inhibits oxidation.

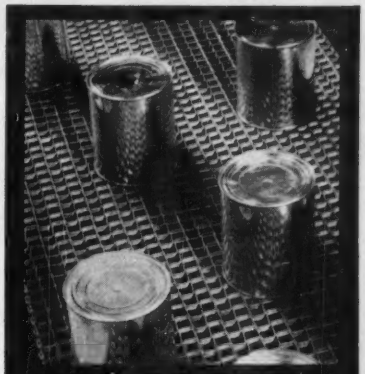
Nitrogen is the major component, to the extent of 84%. Next is carbon dioxide, another "inert" protective gas, about 10%. The other 6% consists of carbon monoxide, argon, and hydrogen.

It is obvious from the presence of carbon monoxide and hydrogen that Vitagen includes chemical reducing power in its protective action.

Vitagen Corp. reports that a mechanical mixture of the constituent gases will not produce the same protective results. Instead, the gas must be produced by controlled combustion of natural gas, butane, or propane in a special generator.

(FE Staff)

IF YOU
PROCESS · PACK · SHIP
FOOD



LA PORTE
FLEXIBLE STEEL
CONVEYOR BELTS

SAVE
TIME · MONEY

WHEN you consider the lower initial cost, reduced maintenance, faster and easier sterilizing, longer service and improved performance of La Porte Belts, it's easy to add up the savings on every application. Besides, the rugged, flexible steel mesh construction takes heavy loads and impacts in stride, and permits the circulation of air and liquids around products in process. The open mesh feature also permits cleaning with a steam gun while in motion and assures a positive drive of the La Porte Sprocket.

La Porte Conveyor Belts resist heat and cold and provide a perfectly flat surface for all types of containers, empty or filled, including shipping cartons.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124
La Porte, Indiana

Please send free literature on your Conveyor Belt.

NAME_____

ADDRESS_____

CITY_____ STATE_____

BENEFIT-PACKED ½-gal. polyethylene-coated milk cartons are creating considerable interest in dairy operator's efforts to check leakers and eliminate wax contamination.

Market looks good for

Poly-Coated Milk Cartons

Big future is predicted for feature-packed container as ½-gal. size and automated equipment debut at Dairy Show

GOOD—BUT not quite good enough. That's the way dairy men describe their wax-coated milk containers. But not the polyethylene-coated cartons.

And that's why so much interest was displayed in these plastic-coated containers at the recent Chicago-held Dairy Show, where American Can, Pure-Pak, and Sealright exhibited high-speed carton forming-filling-sealing machines for ½-gal. poly cartons.

Plastic vinyl milk carton machines have been operating since '49, but what's significant is the recent introduction of the quart and ½-gal. units (see box for carton's features and costs). For instance, American Can Co.'s forming, filling and sealing machine has just gone into operation at Rochester Dairy Coop.'s Rochester, Minn., plant, where it's operating at speeds to 75/min.

Blanks (shipped 250/case) are positioned into magazine, and fed by self-contained suction cup arrangement. Opened, squared cartons are transferred to a 7-station bottom-preheating turret, where sealing surfaces of bottom flaps are heated to proper temperature. Formed, heated bodies then proceed to a 6-station turret, while heated, collapsible horns support cartons during flap closing and pressure sealing. Bottom-sealed cartons next continue to UV sterilizer (for 5-sec. treatment).

Formed cartons now go to rotary, 8-station filler. Each station is arranged with filling tube, bottom shut-off, and completely enclosed piston-type measuring valve comprising two disks. One disk rotates for recharging through ports, again rotates for shutting ports and closing filling cycle. Filler bowl supplies milk during filling—from bottom of valves to permit complete self-cleaning.

Filled cartons continue to rotary, 7-station turret for heating of top flaps. From here, they go to top former-sealer for pressure-sealing of top flaps. On discharge belt, cartons are turned to horizontal position for feeding to automatic caser. Two market units (hot- and rubber-types) brand and ink codes, dates, etc., on filled-sealed cartons.

As cartons come into position on filler, a lifter brings them into position with flow pipe of valve extending 1/16 in. from bottom of cartons. Valve opens, and milk flows into containers, with flow nozzle extended below level of fill line at all times to prevent foaming during a 2.3-sec. fill.

Clean-up time takes 4-6 hr. Cleaning for product changeover requires 5-10 min. Filler employs a patented piston-type valve using the bottom-fill principle. No filler bowl's necessary, since milk is practically fed directly from supply line. However, a small bowl is used to incorporate a float valve.

Sterilizing of cartons is accomplished at two stations: (1) by circulating hot water (180 F.) at bottom sealer; and, (2) by UV lamps at following station.

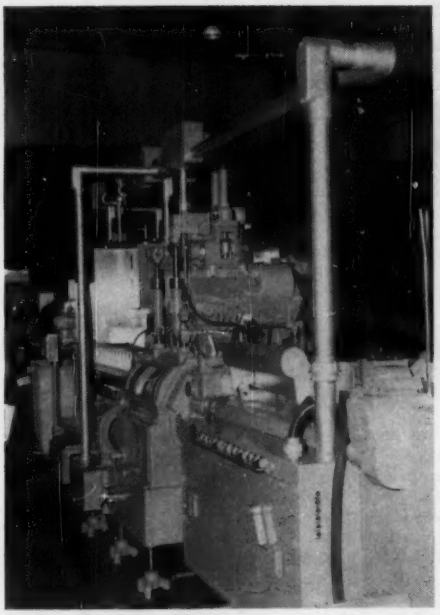
Pure-Pak's ½-gal. forming-filling-sealing machine handles 72 poly-coated containers per min. Machine occupies little space (5¾ x 15½ ft.) and features a minimum of transfer points.

Earlier this year, Pure-Pak also leased two quart machines to dairies in New York and Pennsylvania.

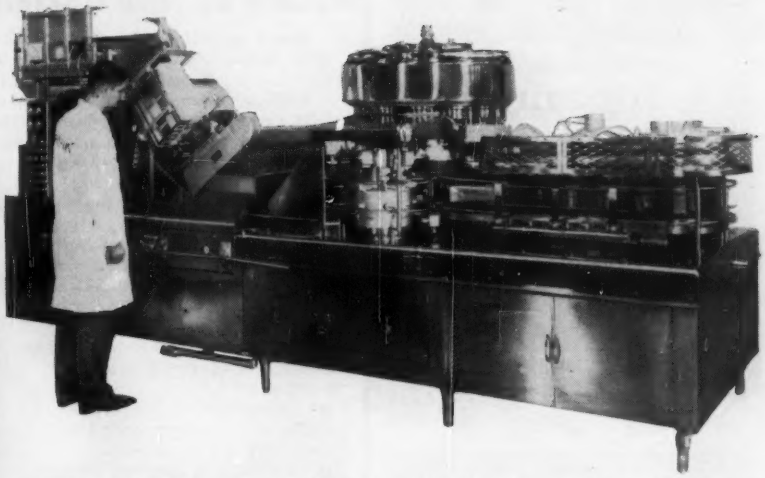
Knocked-down, pitcher-type carton blanks, shipped 250 to a case, are loaded into a 2-case capacity

FE Staff

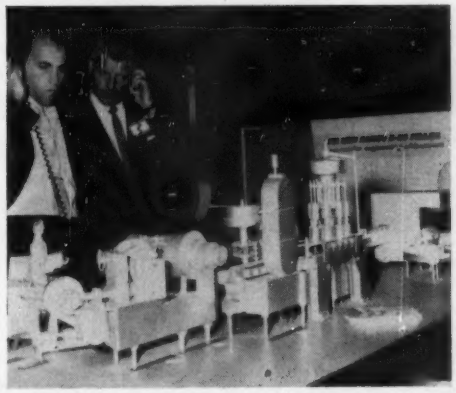
3 Machines Automate Packaging



NEW ½-GALLONER from Sealright forms-fills-seals poly-coated cartons of various sizes at speeds of 70/min. Cartons are formed with aluminum foil-protected corner pour, and welded side and bottom seals.



LATEST ADDITION to Pure-Pak's line of plastic-carton machines is this new unit equipped for ½-gal. Unit sets up containers with protective gable-top and sanitary pouring spout.



MODEL of American Can's ½-gal. forming-filling-sealing unit installed at Rochester Dairy Coop. was displayed at Dairy Show. Machine is designed to handle 75 cartons/min.

magazine. Blanks are then suction-fed to a rotary, 10-mandrel, carton former that pre-heats (with super-heated air), bottom-tucks, and water-cools formed cartons. A chain-driven stripper next removes cartons from forming mandrels, as a stainless paddle uprights cartons proceeding to the rotary, 4-head breaker that pre-breaks cartons' top gable.

Cartons now continue to a rotary, 12-spout filler with adjustable heads. Milk's gravity-fed from 35-gal. filler bowl. Filled containers then move, in sequence to discharge, through gable former Calrod-type electric heater, plow-type sealing tunnel, 6-head rotary water-cooled sealer, and rotary gater to discharge.

In event of jam-up or machine-stoppage, heat-sealing units retract to prevent carton burning, and super-heated air goes on low heat. Rear-end electric clutch clears machine — from carton stripper to filled-sealed carton discharge—in event of front-end jam-up.

Sealright's machine completely sterilizes, shapes, fills, and seals ½-gal. poly-coated paper milk cartons at speeds up to 70/min. Unit also handles other size cartons (pints, quarts, 1/3 qts. and 10-oz.) fabricated from three basic components—sidewall, top, and bottom blanks as well as aluminum foil to protect corner pour. Machine is about 4½ ft wide, 7¾ ft. high and 19½ ft. long.

Ira Wilson & Sons Dairy in Detroit, Mich., has been test-marketing ½-gal. polyethylene-coated milk containers throughout 1,000 retail outlets with favorable consumer response.

Firm's Sealright machine operates this way:

Sidewall carton blanks are individually "machine-sliced" from magazine and fed into a 4-ft. electrically-operated gas oven for heat-sterilizing and pre-conditioning of plastic coating. Roll-fed, heat-sealable foil laminate is then applied to flat blank at corner-opening location.

Pre-conditioned sidewalls then proceed to the rotary former which comprises eight forming mandrels. Sidewall and bottom blanks (also magazine-fed and sterilized in another electric-gas oven) are pressure welded.

Cartons discharged from forming mandrels are vertically positioned for alternate feeding onto tandem rails, each with 20 vertical indexing rakes mounted on reciprocating horizontal bar. This mechanical system indexes cartons through filler and finally top-blank sealer. On each tandem-operated carton-indexing line, cartons are sequence-filled to eliminate excessive foaming.

Four volumetric displacement-type cylindrical filling heads, operating in pairs, accurately mea-

in packaging

Weyerhaeuser

(Ware'-hous-er)

is pronounced

Ingenuity

(In-je-nu'-i-ti)

If there were a popular demand for autumn leaves, Weyerhaeuser Ingenuity would package them to give you a selling advantage.

Much more goes into Weyerhaeuser cartons than the contents they protect. Each represents the skills and experience of a large team of packaging specialists. From timber—grown as a crop—to merchandising excellence, every step of production is carefully planned to satisfy and economically meet the needs of each carton user.

Impelling design for high shelf-appeal, plus high-fidelity printing, gives Weyerhaeuser cartons the "quality look" that attracts self-service shoppers. Carton uniformity speeds filling and closing, reduces costly rejects. Shipments-as-promised enable users to maintain efficient production.

Working with Weyerhaeuser is a pleasing experience in carton ingenuity. We invite your challenging problems.

ASK FOR FREE BOOKLET

This informative "Ingenuity" booklet colorfully explains how Weyerhaeuser can service you. It shows not only how Weyerhaeuser works but what Weyerhaeuser will do for you.

Weyerhaeuser Company

Boxboard and Folding Carton Div.

Headquarters
919 N. Michigan Ave.,
Chicago 11, Ill.

Sizing Up New Containers

Quart polyethylene-coated milk cartons made their debut in '59 after Sealright's 10-yr. experience with vinyl-coating. Now, the ½-gal. size is offered by several firms to compete with bottles.

Already, some dozen companies are extrusion-coating paperboard milk cartons and using around 100 million lb. of resin annually. More and more dairy names are appearing on the poly-coated containers that customers are finding easy to carry home, store in the refrigerator, and discard.

And feeling around the recent Dairy Show was that most of the quart and ½-gal. milk cartons will be poly-coated within 2-3 yr.

Here are just a few of carton's features:

► Leakage, a scourge for retailers and consumers, is reduced. (About 1% for poly compared with 2% for wax was opinion at Dairy Show).

► New containers are clean, non-greasy, and provide top-notch eye appeal.

► Resistance to scuffing and sogging is boosted with smooth bottom exterior that slides freely on dairy conveyors and eliminates wax buildup.

► Lightweight ½-gal. cartons are easier to handle than glass, cutting costly dead weight on home-delivery runs and increasing number of units in display cases.

► Plant operations are cleaner since wax-coating tanks, coolers, conditioning rooms, etc., are abolished.

► Filling speeds (for ½-gal., up to 75/min.) are comparable to those handling wax cartons.

► Machines (see article) will form-fill-seal various sizes, though emphasis is now on ½-gal.

► Cost of equipment and carton will be competitive with wax cartons. In most cases, equipment will be leased.

Some time ago, poly-coated cartons were expensive—more than $3/M more than wax or vinyl-coated quart size cartons. But now suppliers report that larger and speedier coating machines are narrowing this price differential. Resin costs are less—down from 61¢/lb. in '49 to 35¢/lb. today. Moreover, poly coating (0.5 mil on each side) uses only about half as much resin as the earlier vinyl. Too, 1-lb. of poly covers about five times as much board as 1-lb. of wax.

sure and deposit 1 pt. of milk from filler bowl into dairy-sterilized ½-gal. cartons as they're positioned at each of the four filling heads.

Each of the four filler heads is adjusted to deliver ½ pt. of milk into quart cartons. When machine is running on pints, only two ½-pint delivery filling heads are used. Heads are manually switched within seconds when machine's handling ½-pt., ⅓-qt., or 10-oz. cartons.

After metered filling, top blanks are pressure-weld sealed to filled cartons. In a manner similar to "bottoming" formed carton bodies, the filled containers are "topped." Poly-coated tops are magazine-fed to electric-gas oven to be first gas-flame sterilized and electrically heated. Tops are then welded to cartons when indexed through a double-head sealer.

Machine's features include:

. . . Electrical interlocks with auxiliary equipment (coders, counters, casers, etc.).

. . . Sealing head-indicator lights.

. . . Heater elements fuse-protected with blow-out signal indicators.

. . . Light and warning horn system for fluid-level control.

. . . Automatic start-delay and warning horn to alert operators.

. . . Convenient emergency stop buttons and electrical braking to stop all action.

. . . Automatic positioning at beginning of cycle when stopped.

. . . Overload spring-clutches that release at jam-up.

. . . Low milk supply and no side-wall blank-feed.

. . . No top and bottom blank-feed when mating component's missing.

. . . No carton in filling position and no milk dispensing.

. . . No gas flow unless electric spark plugs operate.

. . . Flame detectors to restore flame or cut off gas supply.

Mounted on packager is an enclosed control panel equipped with timers, relays, transformers, and electronic components which activate, control, and monitor machine's many functions. Controlled are heat, milk-supply level, flame detectors and ignitors, mandrel temperatures, metered filling, feeding of package components, etc. (End)

How Weyerhaeuser Ingenuity Helps Lipton Meet High Packaging Standards

Prepared Soup-Mix Presented Marketing Problems Lipton has Solved Most Successfully

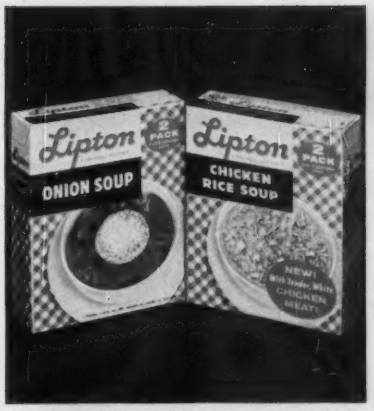
Folding cartons do many things well, but—until Lipton introduced its now-famous "red table cloth" carton—it often was difficult for shoppers to visualize "a steaming bowl of soup in a box."

Because impulse-buying is so important to soup-mix sales, the Lipton Advertising Department worked closely with Frank Gianninoto & Associates, nationally known designers, in developing an attractive carton design that created a feeling of roundness and expansion. A bowl of steaming soup was enticingly illustrated in full color.

This design was submitted to Weyerhaeuser—a leading producer of Lipton tea cartons for over 10 years—for trouble-free volume-manufacture and use. Essential were exact color conformity . . . accurate register . . . close dimensional tolerances . . . uniformity of stock for quick filling-closing . . . durable shelf-life . . . dependable deliveries on schedule. Lipton knew from experience they could depend on Weyerhaeuser to meet these established high standards.

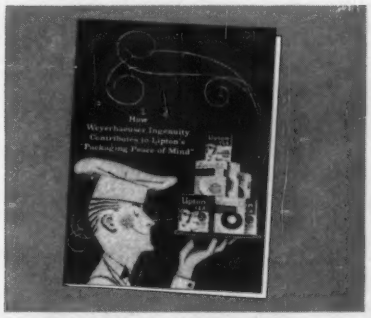
If you, too, want packaging peace of mind, look to Weyerhaeuser!

In packaging **Weyerhaeuser** (Ware'-hous-er) *is pronounced* **Ingenuity** (In-je-nu'-i-ty)



SOUP'S ON. Lipton Soups in striking Weyerhaeuser 4-color folding cartons changed America's eating habits. With high shelf-appeal, they attract millions of self-service shoppers.

"BRISK" Lipton Tea. Black tea, green tea, bulk or bagged—it's Lipton's in Weyerhaeuser cartons. Precise color, register, and clean reproduction say "quality" unmistakably.



THIS FOLDER YOURS FREE. See for yourself how Weyerhaeuser works with Lipton—how Weyerhaeuser can work with you.

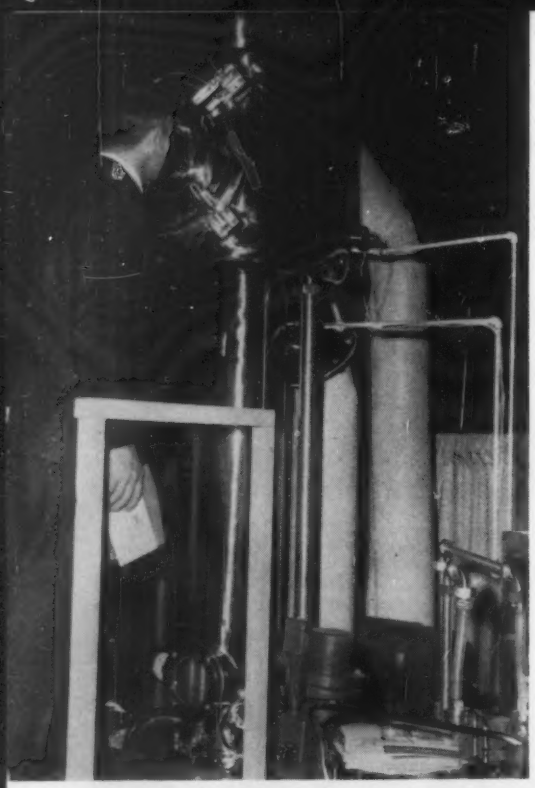
Weyerhaeuser Company

Boxboard and
Folding Carton Division

Headquarters:
919 N. Michigan Ave., Chicago 11, Ill.

23 Highlights of

New Dryer, Evaporator

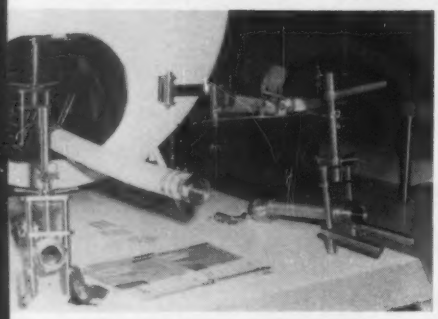


BOILERLESS EVAPORATOR cuts fuel costs. Unit compresses water vapor evaporated from milk, uses it for heating.—Henszey Co., Inc., Watertown, Wis. (447)

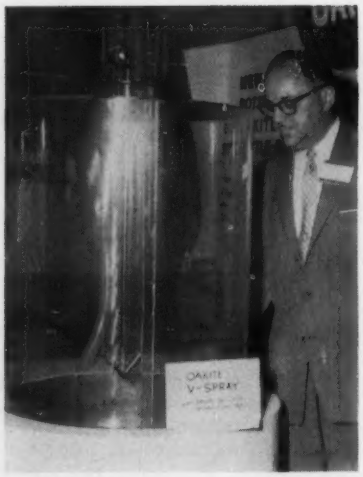
VERTICAL SPRAY DRYER has multi-nozzle spray system, exhaust-air outlet and balanced air inlet, vertical side walls, and mechanical or cloth bag-type collectors.—C. E. Rogers Co., Detroit. (446)

3 Special Cleaning Units

PORTABLE, lightweight unit is quickly installed. Adjustable for tank openings, it delivers high volume of cleaner at comparatively low pressure, has effective vertical and horizontal spraying range.—Diversey Corp., Chicago. (444) ▼



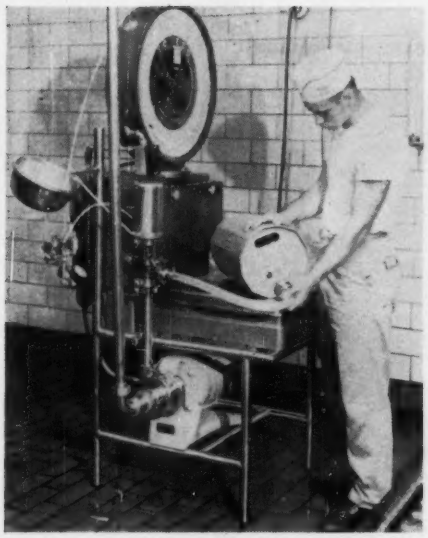
NEW DESIGN cleans any length over-the-road tanker. Features center ball sprayer for soft sprays, and two precision nozzles for harder sprays.—Klenzade Products, Inc., Beloit, Wis. (445) ▶



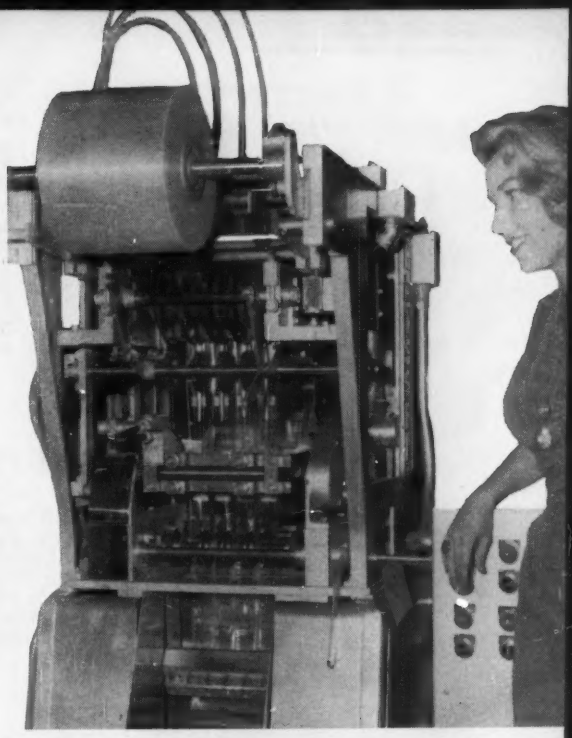
PERMANENT V-spray unit (arrow) gives complete coverage of interior tank surface. Recirculated solutions are sprayed against upper tank, cascade down sides to bottom. — Oakite Products, Inc., N.Y.C. (443)

DAIRY SHOW

Latest in automated batching units, fillers, sealers, sanitation, heat-processing and separating at Chicago exhibit

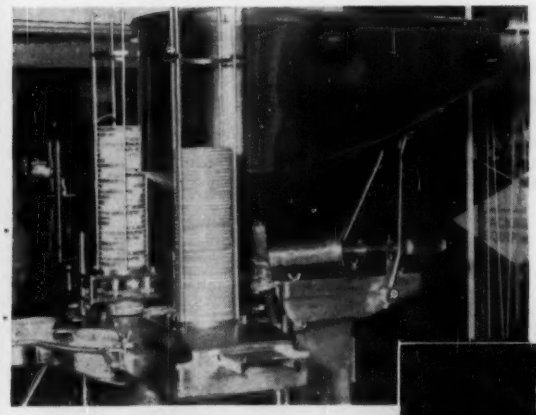


AUTOMATIC FILLER dispenses weight-controlled amounts of milk or ice cream mix into new disposable container (containerboard wrap over a flexible plastic bag) at speeds of 6-7/min. Sensitive weight controls close filling valve when volume's attained. — Weyerhauser Co., Beverly, N. J. (435)

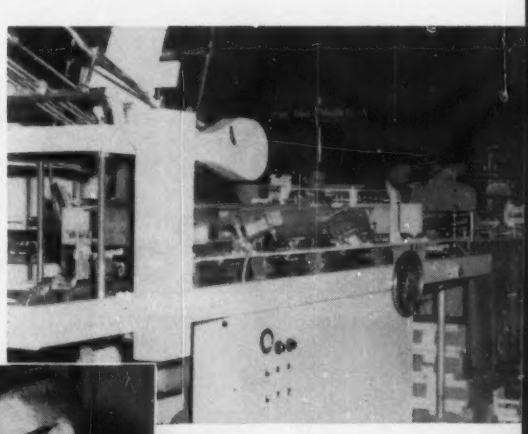


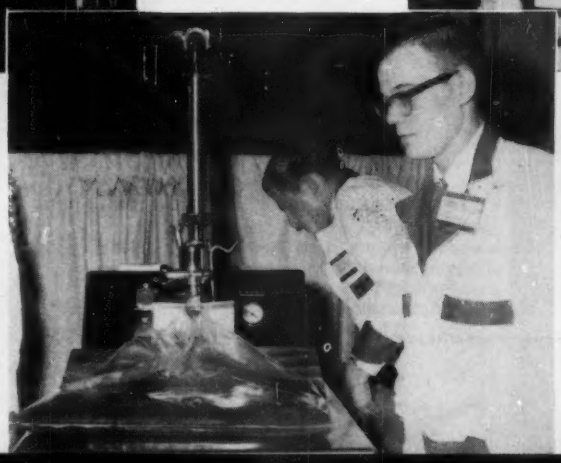
PLASTIC-POUCH PACKAGER measures, forms, fills, and seals four water ices per cycle from two 8¼-in. webs of material. Pouches may be slit or perforated. Four displacement piston pumps provide four flavors.—Hayssen Mfg. Co., Sheboygan, Wis. (433)

5 New Fillers



FILLER for 5-gal. disposable bulk milk container automatically weighs milk to predetermined weight through pierced sealed collar of polyethylene bag.—Scholle Container Corp., Long Beach, Calif. (434)





CUP FILLER features built-in lubrication, no cup-no fill and no cup-no lid controls, bottom ink coder, double rotary turret for tall cups, and special filling nozzles for clean filling of dips, sour cream, salads, and cottage cheese. — Dixie Cup Div. of American Can Co., Easton, Pa. (431)

PACKAGING SYSTEM forms, fills, and seals ½-gal. reclosable-type ice cream cartons at speeds up to 80/min. Formed cartons are pneumatically fed to and discharged from single-spout filler that easily converts to 3 spouts when filling 3 flavors.—E. J. Schoettle Co., N. Wales, Pa. (432)

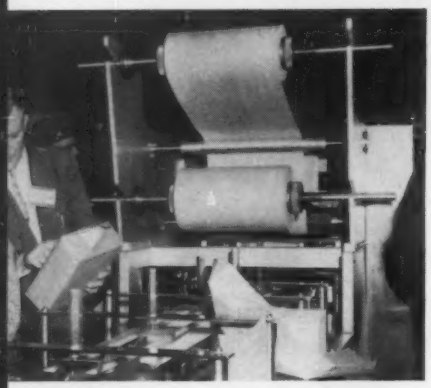
23 Highlights of

DAIRY SHOW

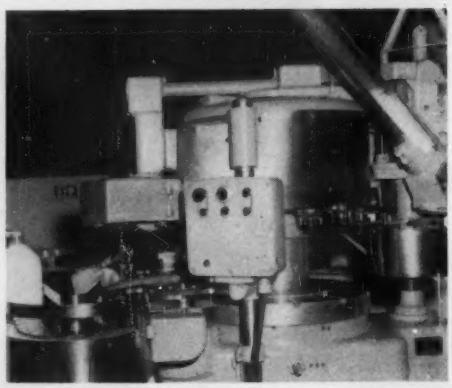
(Continued)

SEALING ATTACHMENT for new top-serving ice cream carton rolls into position on modified Anderson filler. Latter includes new carton breakers and interchangeable end-folding attachments which replace locking shoes. Unit is easily converted for end-locking, if desired. — Marathon Div. of American Can Co., Menasha, Wis. (438)

3 Latest Sealers

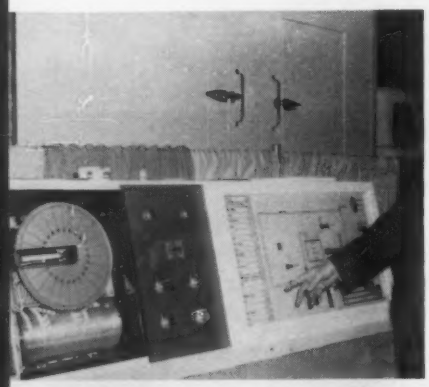


BUNDLER kraft paper-overwraps pints (8), quarts (4), and ½-gal. (2) cartons into tight, glue-sealed packages at rates of 10-60/min. Features easy-to-clean stainless surfaces and sealed glue-pressure system—Anderson Bros. Mfg. Co., Rockford, Ill. (436)



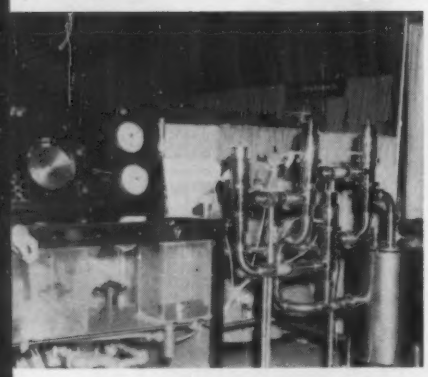
BOTTLE HOODER handles ½-pt. to gallon jugs (round or square) at speeds from 60-160/min. with spiral feed that times bottles for minimum breakage. Hoods are sterilized (550F.) prior to sealing.—Sealright-Oswego Falls Corp., Fulton, N. Y. (437)

4 Automated Cleaning Systems

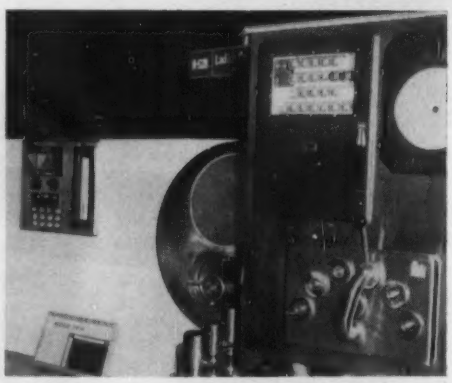


PROGRAM CONTROLLER for CIP and process flow with fixed and variable timer provides 60 separate steps to accomplish any of 32 functions.—Tenor Co., Milwaukee. (439)

AUTOMATED CIP and process flow system employs selector switches (A) and process planner (B). System programs tanker, CIP line, and storage tank cycles.—Wizard Gauge Co., Inc., Los Angeles. (440)



ENGLISH SYSTEM comprises centrifugal pump and spray balls. Connected to pump's suction side are water supply and tanks of concentrated detergent and sanitizing solutions. — The A.P.V. Co., Ltd., Manor Royal, Crawley, Sussex, England (441)

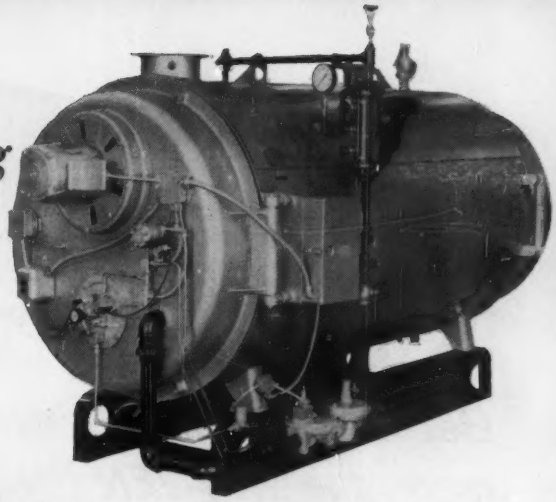


PACKAGED multi-tank CIP unit features: Cost- and space-saving dry chemical feeding; air - open, spring - close valves; and simplified punch-card cleaning cycle.—Ladish Co., Fesco Div., Barrington, Ill. (442)

For more information, circle key numbers on Reader Service Card, back of book

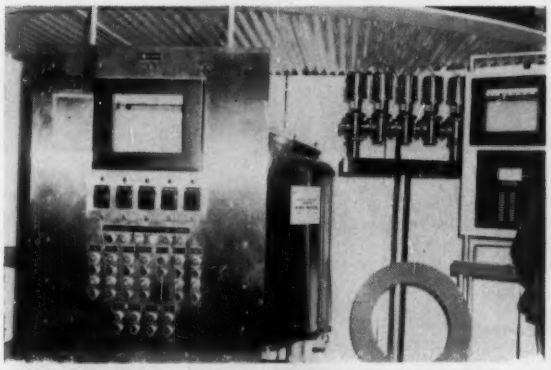
Advanced Cooling, Heating

TRUCK-REFRIGERATION SYSTEM comprises engine-mounted compressor belt-driven from crankshaft, chassis-mounted condenser and evaporator. It can be powered electrically during standby.—Thermo King Corp., Minneapolis. (452)

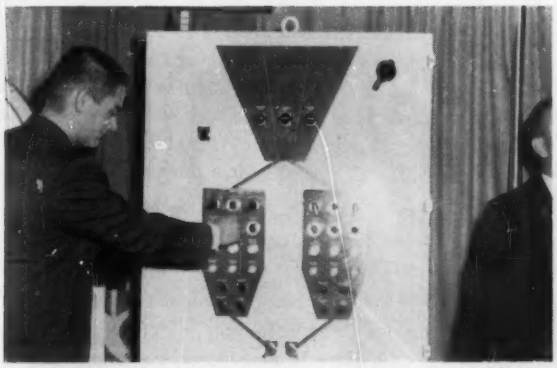


SPACE-SAVING packaged boiler meets needs of smaller users of high-pressure steam in dairies, canneries, and other food plants. Available in 15 to 60-hp., units are oil-, gas-, or oil-gas-fired.—Cleaver-Brooks Co., Milwaukee. (453)

2 Automatic Batchers

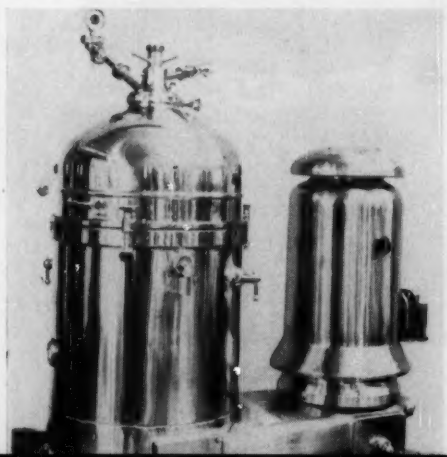


SYNCHRONIZED electronic batch-mixing system automatically assembles all mix ingredients into weigh tank, start-stops pumps, opens and closes valves.—Cherry-Burrell Corp., Cedar Rapids, Ia. (448)



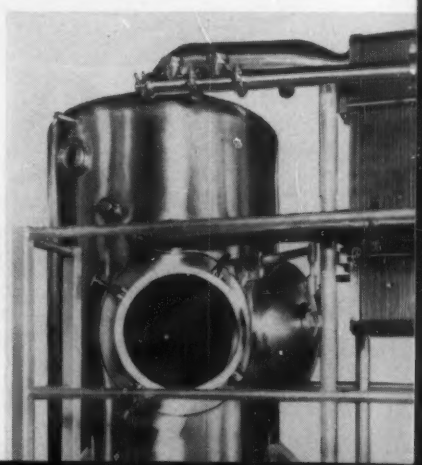
DUAL UNIT automates weighing, batching, mixing and blending of solids and liquids. Graphic panel shows positions of storage bins and weigh batchers.—W. M. Sprinkman Corp., Milwaukee. (449)

Latest Separator, Flavorizer



50,000-LB./HR. warm milk separator is driven by vertical motor through V-belt drive directly connected to bowl spindle. With accessory, unit can also be used as clarifier and/or standardizer. — Centrico, Inc., Englewood, N. J. (450)

50,000-LB./HR. FLAVORIZER, panel controlled, uses VHT steam injection heater and plate condenser. System instantaneously exposes milk to high temperature, followed by quick cooling.—Cherry-Burrell Corp., Cedar Rapids, Ia. (451)



It's Horse Sense . . .

Why Chance Leaks in Seat Rings

Get Monel Seat BRONZE GATES made the way JENKINS makes them

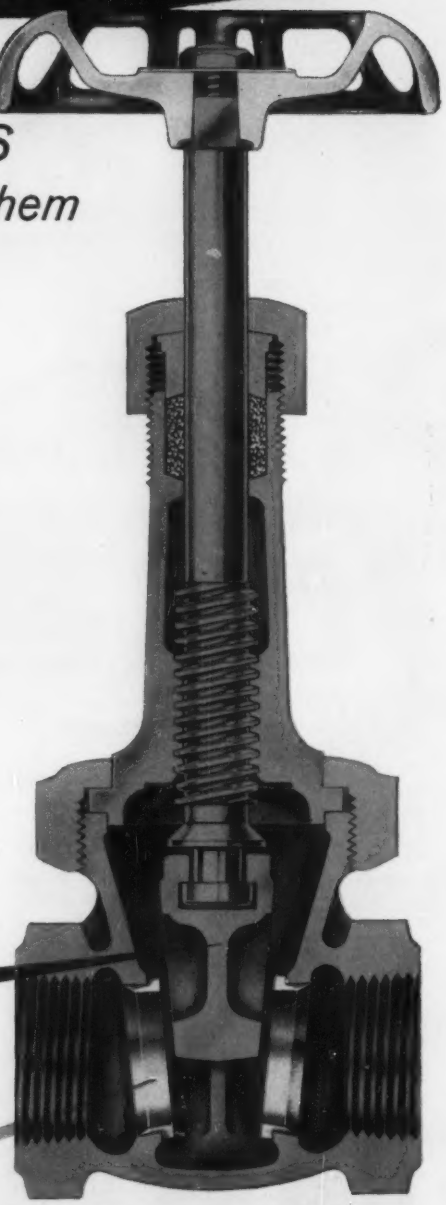
It's plain horse sense that you had better have the Monel seat rings EXPANDED (ROLLED) into the valve body if you want them to stay tight and leak-proof.

More horse sense . . . there's nothing valuable lost through having seat rings that can't be replaced by a regular maintenance man . . . **IF** the bronze or nickel alloy wedge has a lower degree of hardness than the heat-treated Monel seat rings. *(The way Jenkins makes them)* Then, the wedge takes the wear and seat rings are relatively unaffected.

Obviously, there's no faster, simpler or cheaper way to renew tightness and efficiency than to slip on a new wedge. And that, plus renewal of packing as needed, is all you need do to assure good performance from Jenkins Monel Seat Bronze Gates for as long as you'll need to care. Good service for scores of years is common.

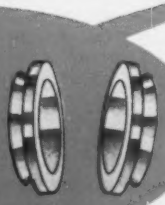
Long, low-cost life also results from greater-than-ever-needed strength in every part of these valves. The records of millions of Jenkins Bronze Gates show you get full protection against all the stresses encountered in use.

Your local Jenkins Distributor will quickly supply your needs from a wide variety of Jenkins Bronze Gates. For information about these valves, write for folder No. 181-C. Jenkins Bros., 100 Park Ave., New York 17.



WEDGE is less hard than seat rings. Wear affects this easily replaceable part . . . NOT seat rings

SEAT RINGS are expanded (rolled) into body. Permanent, all-around support is essential to prevent deforming, loosening, shifting, LEAKS



JENKINS VALVES

LOOK FOR THE JENKINS DIAMOND

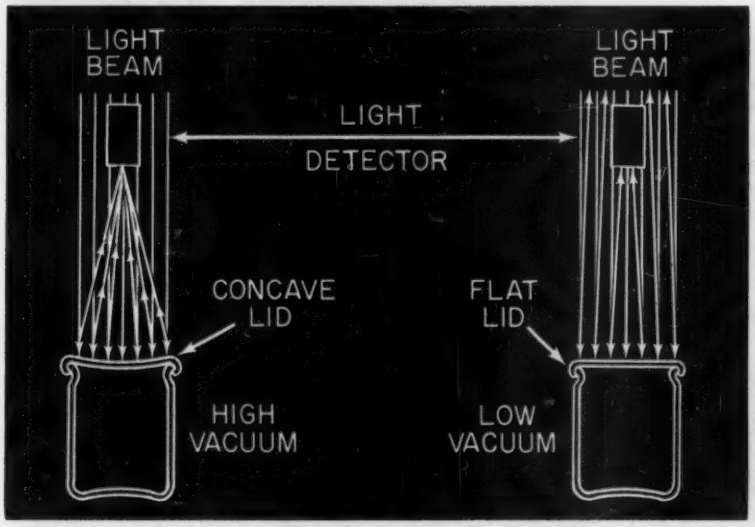
JENKINS SINCE 1864 Jenkins Bros

Sold Through Leading Distributors Everywhere

practical ideas

Checks jar vacuum . . . Boosts cleaning efficiency . . . Latest safety color code

FOOLPROOF PHOTO-ELECTRIC SYSTEM DETECTS INSUFFICIENT VACUUM IN GLASS JARS



Here is a simple, efficient means for detecting insufficient vacuum in jars as they come off the filling line.

The system was developed by Swift & Co. scientists for use on baby-food lines, but is obviously applicable to other packs. It replaces the old manual tapping of lids with a drumstick, by which an experienced operator could tell from the sound whether vacuum was proper.

Key to the new technique (diagram) is the fact that the lid of a jar under vacuum is distorted in a concave shape, the deformation being proportional to the degree of vacuum. Coupled with this is the fact that a beam of light striking a concave lid is reflected to a focal point determined by the lid's curvature. In contrast, the lid of a jar under low vacuum is flat, thus does not focus the reflected rays.

The detector consists merely of a light source and a light-sensitive cell. When a properly evacuated jar passes under the light, reflected rays focus to produce a signal allowing the jar to pass. If the jar lid does not focus the reflected rays as it passes under the light beam, the jar is rejected.

Curbs Low-Temp Damage To Potatoes in Transit

Truckers hauling potatoes for chips can guard quality in cold weather with a blower-fan system and heater in both front and back of trailer. According to USDA research, chipping quality of potatoes is injured at much below 50F.

Tests were made with two heaters in front of trailer, two in back, one in back, and one in front; also, with and without fans to circulate warm air. In addition, loadings in cold weather with and without a loading tunnel, and with and without fans were checked.

Most effective is use of loading tunnel and fan, with heater in each end of trailer, built-in air circulator, and floor racks that permit good circulation of warmed air around load. — *Office of Information, U. S. Dept. of Agriculture, Wash., D. C.*

Easily Handled Dock Board

Here's a handy way of picking up a heavy dock board (photo). First make sure you use a steel dock board (5x5 ft., in our case) with 3½-in. high safety side guards. Then use two lengths of 1-in. steel chains, permanently securing each length of 2½-in.-dia. eye hooks welded half-way along two sides of the dock board. Now cut out two slots (½ in. wide by 1½ in. long) near center of board to temporarily secure the other two lengths of chain when lift truck moves board to or from dock.

Before unloading goods from box car, make sure you remove the two chain lengths from the center of the dock board. Otherwise load would topple off of truck when its wheels ride over the chains.—*Jerry Schultz, Production Manager, Wm. Barnes, Inc., Minneapolis.*

(turn page)

Tighten Down on FOAM

with Dow Corning Silicone Defoamers*

There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

FREE SAMPLE
and new manual on foam control

first in silicones
Dow Corning CORPORATION
MIDLAND, MICHIGAN

Dept. 3712

Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

practical ideas

Color Code Identifies Piping, Hazards

Increased emphasis on plant safety brings this new color-code recommendation for fruit-processing plants. Following is the legend:

Safety Color Code

Color	Meaning	Example
Red	Fire protection	Location of fire protection equipment.
Orange	On guard	Warns of danger and equipment that might cut, crush, or injure. Use on machine guards and similar items.
Yellow	Watch out	Indicates stumbling, falling, or moving hazards. Yellow used alone on moving objects, such as overhead carriers or lift trucks; yellow and black as parallel bars on stationary hazards such as building columns or stairways.
Light Green	Safety	Location of first aid equipment or gas mask.
Blue	Precaution	Use on switch boxes, operating levers, and on tags for machinery under repair.
White	Traffic	Indicates aisles, traffic space, and storage space.

Packing or Processing Equipment Color Code

Two alternate colors are recommended on packing or processing equipment. One is the familiar "machine gray." The second, said to have a more relaxing effect on the eye, is gray-green similar to "vista green" by Pittsburgh Paint Co.

Piping Identification Color Code

Color	Meaning	Example
Red	Fire-protection equipment	Fire or sprinkler lines.
Orange	Dangerous materials	Ammonia discharge and liquid lines.
Yellow	Dangerous materials	Ammonia suction lines.
Green	Safe materials	Water lines, defrost tank.
Gray	Dangerous materials	Steam or gas lines.
Aluminum		Piping hangers.

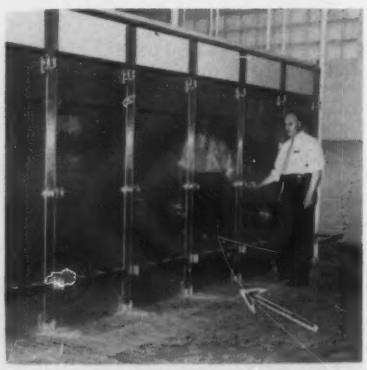
—Food Industries Research & Engineering, 33 S. 2nd Ave., Yakima, Wash.

Drains Cut Cleaning Time Do Better Job, Too

We knew that hosing the tile floor of our proof boxes would be quicker and easier than mopping them, but sanitary regulations don't permit floor drains in these units.

So we installed iron-grate-covered floor gutters (1-ft. deep) just outside the boxes (arrow), parallel to loading and unloading sides. Gutters are pitched slightly to feed 3-in. drains, and floor slopes away from box for 1½ ft. to assure good drainage into gutters.

Now, proofer floor is hosed instead of mopped. And we do a still better cleaning job by running a

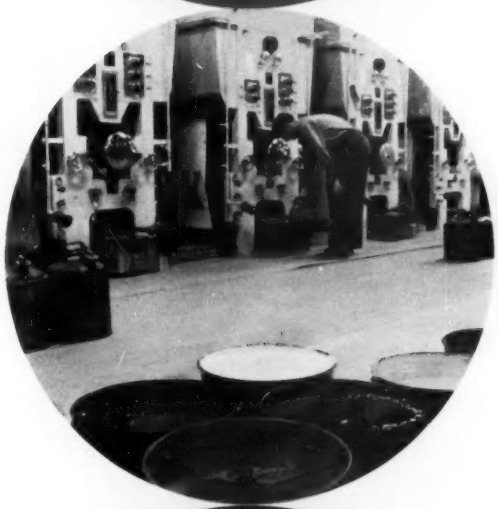


power scrubber through the boxes, followed by hosing.—*M. Asproyerakas, Vp. & Chief Engineer, National Baking Co., Chicago.*

CIRCLE 52 ON READER SERVICE CARD
CIRCLE 53 ON READER SERVICE CARD ➔

It takes more than paperboard to make

OLIN CARTONS



printing skills • modern equipment • resources • basic research • quality control • package design • dedication . . .

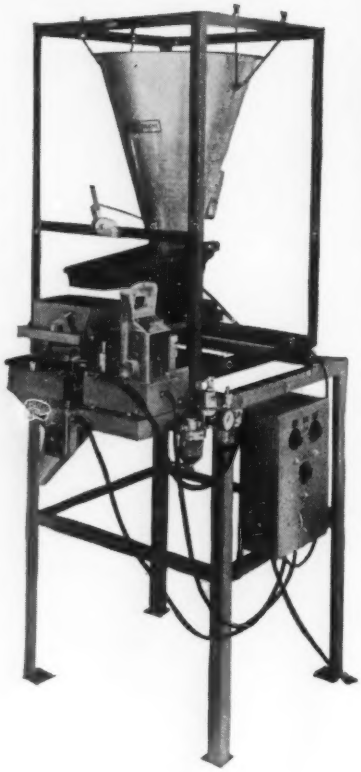
OTHER OLIN PACKAGING PRODUCTS: **CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER**
Write for Illustrated Brochure "The Olin Carton Service"

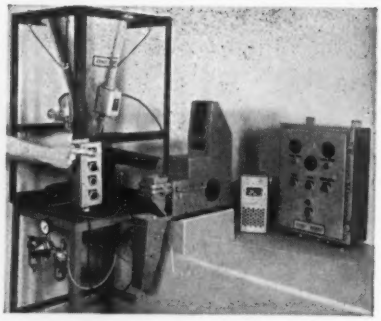
OLIN MATHIESON
Packaging Division
P. O. Box 488, West Monroe, Louisiana

EXACT WEIGHT® Automatic Net Weighing Machines

FOR PACKAGING — BAGGING — BATCHING — COMPOUNDING

Featuring
Over-under indicator for constant visual check on weighments

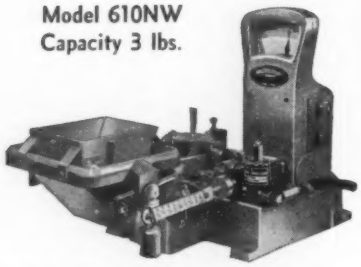




PRECISION AUTOMATIC MODEL 4601NW

The machine above is designed for weighing dry, free-flowing materials with accuracies of 1/10 gram on quantities below 10 grams and one per cent accuracy on quantities of 10 grams and above. Combines a high-accuracy Shadograph® Scale, air-operated dump mechanism, hoppers, vibratory feeders and photoelectric controls. Precision models with capacities from 50 grams to 500 grams. Write for Bulletin 3363.

Model 610NW
Capacity 3 lbs.

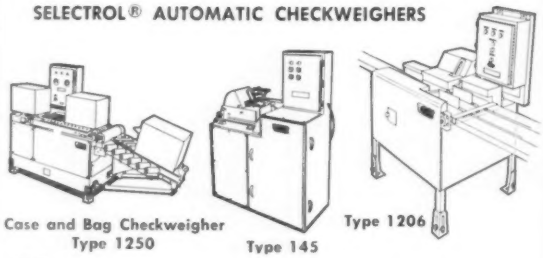


Net Weigher can be supplied without the feeder machine, support frame and discharge chute. The unit may be adaptable to your specific operation.

Model 620NW
Capacity 10 lbs.

OTHER EXACT WEIGHT EQUIPMENT

SELECTROL® AUTOMATIC CHECKWEIGHERS

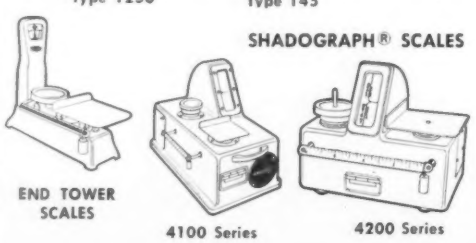


Case and Bag Checkweigher Type 1250

Type 145

Type 1206

SHADOGRAPH® SCALES



END TOWER SCALES

4100 Series

4200 Series

Exact Weight SCALES

High speed, smooth operation and accurate control are among the many advantages offered by Exact Weight Automatic Net Weighing Machines.

Accuracy is assured by the 1:1 ratio lever-design precision industrial scale incorporated in each machine. A special feature is the over-under indicator dial that enables the operator to observe accuracy of each weighment. Visual indication eliminates the need for checkweighing — stops overweights. Machines are available in capacities from 1 gram to 300 pounds, either fully-automatic or semi-automatic models.

Exact Weight offers counsel for weighing problems based on 45 years of experience in industrial scales for all types of applications. Our recommendations will be tailored to your specific needs . . . and at no obligation. Write for Form 3311.

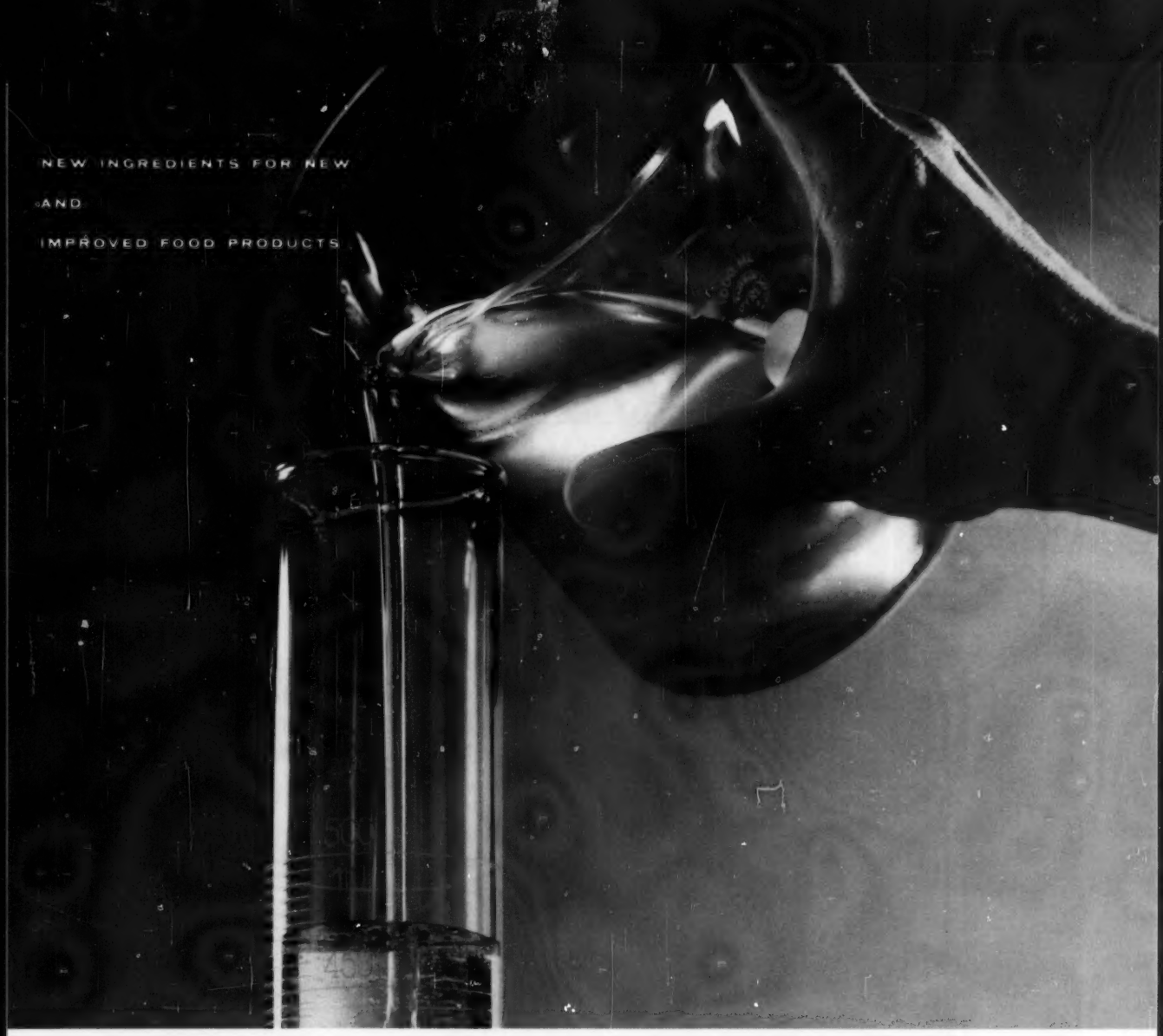
THE EXACT WEIGHT SCALE CO.
910 W. FIFTH AVE., COLUMBUS 8, OHIO
In Canada: 5 Six Points Road, Toronto 18, Ont.

Sales and Service Coast to Coast

Find us in your local 'Yellow Pages'

CIRCLE 54 ON READER SERVICE CARD

CIRCLE 55 ON READER SERVICE CARD →



FLO-SWEET AMBERDEX . . . the sweetener with "character"

Its sparkling clear, amber color tells you, "Here's a quality liquid sweetener with real character!"

Flo-Sweet Amberdex is constantly finding new uses in a variety of foods where something a little out of the ordinary is desired. High in sweetening power, rich in flavor, tops in quality—Amberdex is opening up new sales opportunities for alert producers in the food industries.

If you're working on exciting new products of your own—if you're looking for a full-flavored sweetener that's different, but not too different . . . try Amberdex. Your Flo-Sweet Engineer will be glad to give you full details or write for the brochure "New Ingredients for New and Improved Food Products." It tells all about four new Flo-Sweet liquid sugars!

YOU'LL WANT TO TRY AMBERDEX FOR . . .

Cakes
Cookies
Pies
Breads
Multiple Foods
Wines

REFINED SYRUPS & SUGARS, INC.

YONKERS, NEW YORK

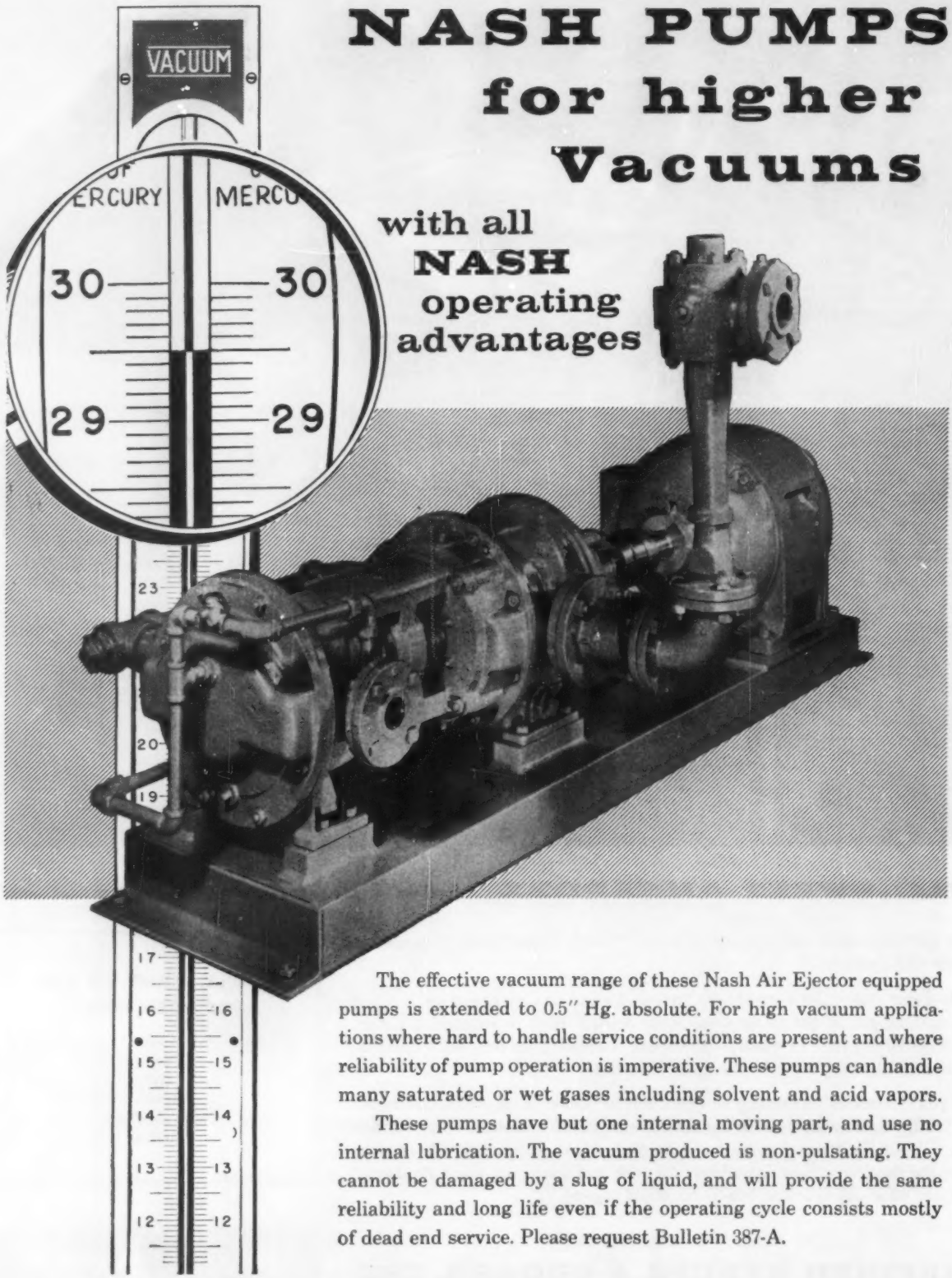
SERVING INDUSTRIAL SUGAR USERS EXCLUSIVELY
FROM YONKERS, ALLENTOWN, DETROIT, TOLEDO

FLO-SWEET

FIRST IN LIQUID SUGAR

NASH PUMPS for higher Vacuums

with all **NASH** operating advantages

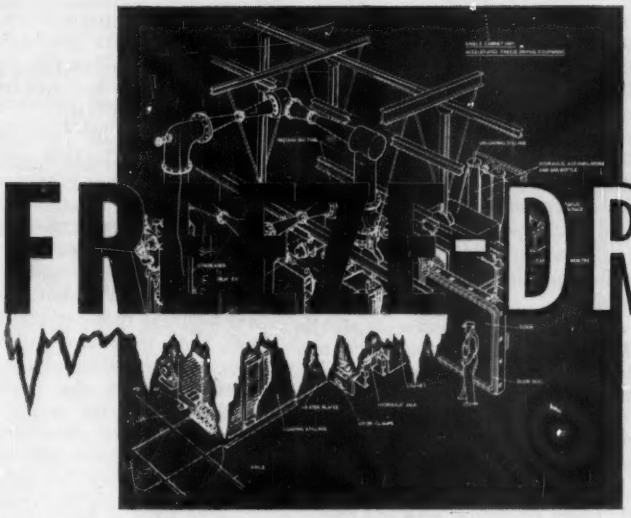


The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.



FREEZE-DRYING

Where It Stands . . . What's Ahead
Your Stake in It

It's coming up fast, so here are the facts you need—experts' views on product quality, costs, markets, equipment, roadblocks, payoffs . . . plus critical trend analysis

WHAT IS FREEZE-DRYING? Basically, it's changing frozen foods (cooked or uncooked) to the dry state by sublimation. Ice in the product goes directly to water vapor, thus bypassing the liquid phase.

Products are dried in a vacuum chamber at very low pressure by controlled input of a small amount of thermal or microwave energy. Foods emerge sponge-like, and the resulting voids aid rehydration.

Equipment accessories include condensers, usually of the refrigerator type, vacuum pump or steam jets, and water condenser.

Drying time depends on the product and its thickness. It usually takes 10-20 hr., depending on equipment and technique. Final product moisture is 1-4%.

Processing is controlled to prevent product thawing, thus drying is carried out at —10 to —20C. Product oxidation is curbed by the low oxygen tension maintained, and occasionally by breaking vacuum with an inert gas rather than air.

By conventional drying, only ground meat or extremely thin strips can be handled satisfactorily. But by freeze-drying, serving-size pieces (½-1-in. thick steaks and chops) now can be processed. Thicker pieces (roasts, for example) require longer freeze-drying, thus present cost and technical problems.

Quality Factors

Freeze-dried products are similar in size and shape to the original fresh products. Low-temperature drying minimizes loss of volatiles, also guards against appreciable chemical, enzymatic, or microbial changes.

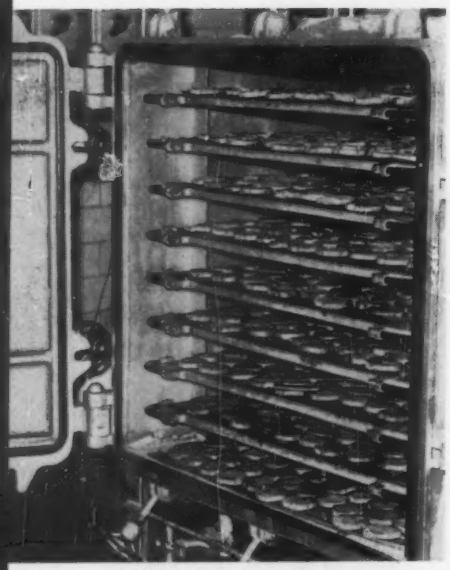
Raw beef, pork, and chicken thus dried closely resemble their fresh counterparts in flavor and color upon immediate hydration. However, they are somewhat dryer, and the beef, especially, is tougher. Dryness results from loss of muscle-protein's water retention.

Tenderness of reconstituted cooked beef is similar to that of the freshly cooked product, but flavor deteriorates on long storage. AMIF researchers have improved meat tenderness and hydration by reconstituting in a 2% brine. Proteolytic enzymes in the hydrating solution also increases tenderness.

Certain fruits are successfully freeze-dried to 5-8% moisture. Apricots are light in color, hydrate rapidly, and taste fresh. Strawberries withstand several years' storage without flavor change. Browning is checked by sulfur-dioxide treatment.

All freeze-dried items deteriorate rapidly in storage unless care is taken to keep environmental ox-

JOHN V. ZIEMBA
Senior Associate Editor, "Food Engineering"



IN SHELF-TYPE freeze dryer, steaks are dehydrated to about one-third their original weight.

ygen and moisture levels low. Best current packaging is a metal container or special film pouch evacuated or purged with inert gas. Low-temperature storage is, of course, also helpful but less desirable from the cost standpoint.

Focus on Advantages

Industry expects these gains from freeze-drying.

. . . Preservation without refrigeration. Take for example, savings in shrimp-storage cost at Liana Co., San Carlos, Tex. Freezer space for frozen shrimp costs 60¢ per cwt., as against 10¢ per cwt. for storing the freeze-dried product.

. . . Weight reduction. Freeze-dried products average about one-third the weight of the original food.

Again take a Liana example. It's been shipping 100 lb. of dried shrimp to Chicago for $1.72, with user getting about 500 lb. when reconstituted. Truck rate is $4.84 per cwt. for frozen shrimp, or $24.20 for 500 lb. of frozen shrimp. Through savings in storage and shipping, Liana sells shrimp in Chicago at a delivered cost of $1.28 per pound of reconstituted product, compared to $1.40 for frozen product.

F. P. Mehrlich, of Quartermaster Food & Container Institute, reported savings as high as 58% by shipping uncooked freeze-dried beef overseas, in place of the 4-way frozen boneless product. Cost calculations for freeze-dried product were based on 10 yr. write-off for equipment and installations. Freezing cost (continuous blast tunnel) for a 6.5 oz. serving was estimated at 0.3¢.

. . . Handling economy. Freeze-dried items packed in flexible film enable better use of space than similar products otherwise processed.

. . . Appearance and acceptability. From military experience, undesirable changes in product color have been minimized. Taste of freeze-dried items (after hydration) generally is comparable to that of fresh product.

Process economics are becoming favorable for marketing of certain of the foods. But before making big moves, industry is carefully weighing product excellence, consumer convenience, freight savings, storage life, elimination of refrigeration, and pakers' seasonal over-supply losses of perishables.

Slow Drying the Problem

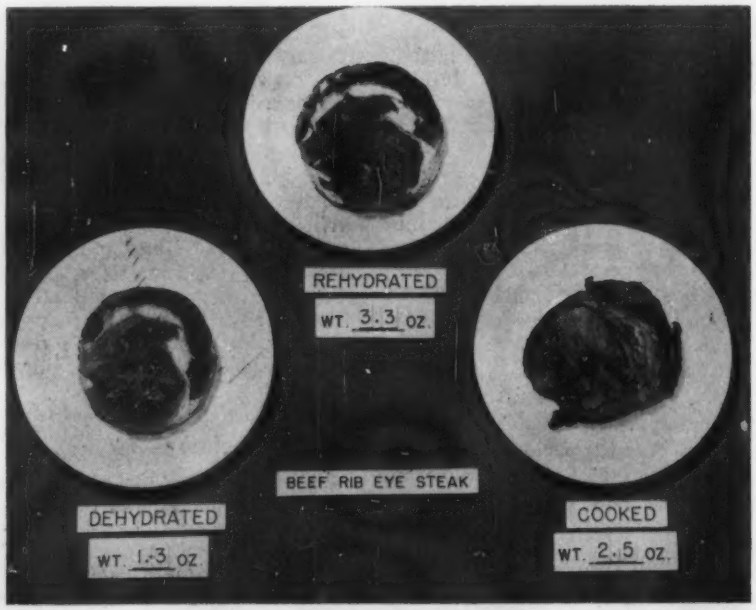
Contrary to usual R & D practice of first developing the process and then the equipment, freeze-dryers are already available for tonnage production. Yet, commercial output in the U. S. is only a few hundred pounds a day because current production costs are too high. Costs are high because the process takes too long. And drying is slow because heat transfer rate is too low.

It's mainly by reducing drying time that production costs can be slashed. So researchers are checking into: (1) microwave heating, (2) larger heat-transfer surfaces, and (3) radiant heating cycles specific for type and size of product.

FMC's John Abbott sees greatest promise in a combination process that uses the most efficient means of heating at each of several points in the drying cycle. Radiant heating might first be used for near-surface evaporation, followed by radio-frequency heating to penetrate the spongy shell of dried product. Finally, warm carrier gas might be used if excessive product shrinking is not a problem.

Our acceptance of freeze-dried items has been slowed by our standard of living. England has accepted such foods to some extent primarily because of her need to import and her relative lack of household refrigerators.

Yet, products like concentrated coffee, and dried milk potatoes have won U. S. acceptance. Should a wartime emergeny arise, chances are there will be a demand for freeze-drying equipment for both civilian and military.



FREEZE-DRIED STEAK is shown rehydrated and cooked. Quality is similar to that of the fresh product when cooked.

To Tickle Your Imagination

Freeze-dried foods could carve a comfortable niche on supermarket shelves, even become stiff competition for fresh, canned, and frozen products. It's possible provided the new items can combine the near-fresh flavor and texture of frozen foods with the relatively inexpensive handling of canned goods.

And the new process could lead to sale of perishables outside of usual channels. Packaged freeze-dried steaks, for example, might be stocked on supermarket shelves without refrigeration, and sold just as candy bars are today. Chains that occasionally reject frozen items for lack of freezer space would have little trouble finding room for freeze-dried foods.

Freeze-drying may also help U. S. firms tap the export market. Room-temperature storage of perishables should have wide appeal in countries lacking refrigeration. Poultry processors, in particular, see the process as the key to broader overseas sales.

Our guess is that exciting freeze-drying developments may come sooner abroad, where freezer capacity and refrigerated transport are limited. Freeze-dryers may appear in isolated regions such as Brazil's cattle grasslands, which are hundreds of miles from slaughter sites and without RR facilities. Freeze-dried meats, with weight considerably reduced, could be shipped by air without refrigeration.

At home, strawberries and raspberries might be freeze-dried on the West Coast for shipment to Eastern preservers. User would simply mix the dehydrated fruit with liquid sugar before vacuum cooking.

We may soon see freeze-dried foods in vending machines. They could, for example, easily dispense a tablet of soup or chowder, which would readily be reconstituted in a cup of water. White-collar workers as well as factory personnel may one day carry packets of many varieties of pre-cooked freeze-dried meals for lunch.

Today, technological emphasis is on cutting freeze-drying costs, which would promote vastly wider use of the process. Many freeze-dried items are already commercially available, and the military has developed some 30 quick-serve meals—chili and beans, spaghetti and meat sauce, and shrimp or fish creole (FE Jan. '58, p. 110).

An interesting note on product development is the belief, held by some technologists, that certain products may be 'genetically designed' for freeze-drying. It's been done with some varieties of fruits and vegetables to make them more suitable for canning and freezing.—**FE Editors.**

Who's Freeze-Drying?

Buzzing around the recent Chicago conference of Research & Development Associates (Food & Container Institute), FE learned that just about every food company is interested in freeze-drying. Some have barely gotten their feet wet, others are ankle-deep. For example:

Armour has been supplying the Army with freeze-dried foods, such as chicken chunks. Looking also at the camping market, it has provided some 300 lb. of freeze-dried items for Sir Edmund Hillary's recent Himalayan expedition. The products, which reconstitute to about 1,200 lb., include ham, chicken, steaks, chops, fruits, and vegetables.

Armour is also eyeing a potentially big overseas market, especially areas lacking refrigeration equipment. That, of course, doesn't rule out our domestic market because refrigeration savings and reduced shipping weight should compensate for higher freeze-drying costs.

Like others, Armour doesn't feel that all foods can be satisfactorily freeze-dried. But the company is so interested in the process that it has just set up a special research lab and pilot plant in Bellwood, Ill. Formerly, such research was conducted at its pharmaceutical lab in Kankakee, Ill.

Thomas J. Lipton's long research into freeze-drying is beginning to pay commercial dividends through large-scale production of freeze-dried chicken meat and mushroom slices for its dry-soup mixes (FE Nov. p. 98).

Liana Co. has been freeze-drying about 5,000 lb. of shrimp daily for institutional channels, and is now about ready for the consumer market. The pack is a peeled, deveined, pre-cooked shrimp in a 13¼-oz. can. Product reconstitutes in 15 min. to about 5 lb.

Company says that higher processing cost is offset by lower shipping costs and elimination of refrigeration. Some users even say the reconstituted shrimp holds up longer than the frozen product.

Liana reports it has recently been offered a contract to freeze-dry ingredients for a large soup manufacturer. And it plans to freeze-dry pre-cooked entrees similar to frozen food specialties.

Wagerized Food Products, Montclair, N. J., is licensing its freeze-drying technique (details not known) to a number of packers. One is Goren Packing Co., Boston, which reportedly will introduce some 50 freeze-dried meat products.

Bernard Food Industries, Chicago, is furnishing, under its Kamp Pack label, a freeze-dried line for campers. Also in the works is a line of freeze-dried survival kits for civilian defense.

Others known researching freeze-drieds are General Mills, Pillsbury, National Dairy, and Wilson.

In Europe, Nestlé and Lever Brothers have long been freeze-drying vegetables and ingredients for dehydrated soups.

Tailoring the Equipment

NRC Equipment Corp.'s P. W. Patton sees improved methods of material-handling, water-vapor removal, heat-exchange, and instrumentation resulting from the technical assault under way in freeze-drying. Older equipment designs must give way to newer concepts providing lower-cost processing.

Needed is a thorough understanding of: (1) variables that foods introduce in freeze-drying and their influence on design of large-scale production equipment, and (2) equipment variations.

For example: Slow-drying products like thick raw beef may call for a long cycle that can't employ belt drying. On the other hand, a pureed vegetable might tolerate high heat inputs, moderate vacuum, extrusion feeding, and doctor-blade removal of freeze-dried product. In the latter case,

belt drying would be indicated because of lower labor cost and continuous operation.

At one time, vegetables were overlooked because some workers felt they had to be relatively expensive to meet high freeze-drying costs. This may not be so for two reasons:

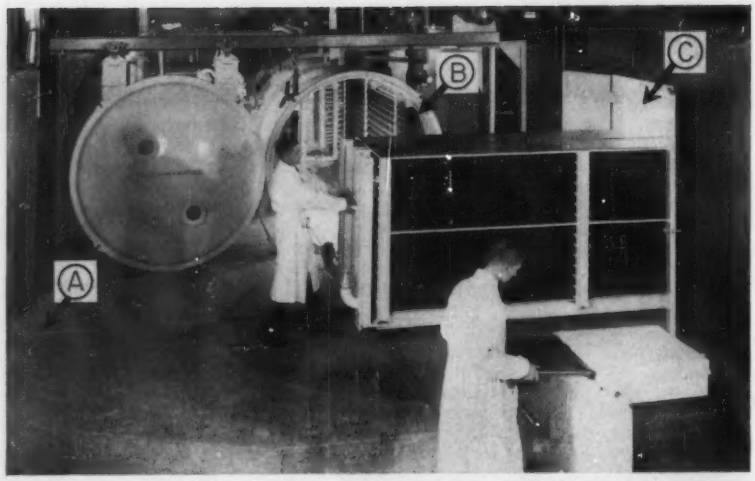
1. Recent large-scale freeze-drying performed by NRC for QM show costs (including equipment amortization, operation, and maintenance) for removing 1 lb. of water from beef range as low as 2 or 3¢.

2. Processing cost for low-priced ingredients may be offset by the added value they impart as convenience items or quality-improvers. Texture improvement of soup vegetables is an example.

Existing plant facilities also influence design of a freeze-drying system. Costs may be cut by using some of a frozen-food-plant's refrigeration capacity for condenser service. Or a plant's large steam capacity would favor using steam jet ejectors for vapor handling.

Patton doesn't think large-scale production of freeze-dried products will be accomplished by multiplying output of small conventional units whatever the type.

Interest in freeze-drying is so great that U. S., Canadian, and overseas firms are now putting more effort into equipment development and production. And they will develop continuous system when production requirements demand them.



FMC'S PILOT-TYPE system produces 700 to 1,500-lb. batches (wet basis). Mobile hot-platen is loaded in cold room (A) for transfer to freeze-dryer (B) and then into dry room (C).

Equipment on Hand

Food Machinery & Chemical Corp. has a test facility geared to 700-1,500 lb. batches (wet basis). A modular-type facility readily expanded to commercial production, it is available for experimentation at nominal charge and on a first-come, first-serve basis.

The batch system uses water-heated shelves and refrigerated vapor-condensing plates within the vacuum chamber. The hot-platen bundle is mobile and is first moved into a cold room for product loading. Then it is transferred into freeze-drying chamber, and finally into a dry-room for unloading. Such handling permits efficient use of labor and equipment by minimizing manipulations and downtime.

System occupies 2,000 sq. ft., which is adequate, for freeze-drying equipment, turntable, and small dry-room — but not cold storage. Drying unit's heating area is 500 sq. ft. Loading rates range 1½-3 lb. per sq. ft., with products leveled to a 1-1½-in. depth on black "Sanfordized" aluminum trays. Vacuum pull-down time is 15 min. (100-500 microns), and condenser temperature is —40F. or colder. (421)

NRC Equipment Corp., too, has lab pilot-scale facilities to measure process variables and to obtain technical data for establishing economical design criteria. Included is equipment for:

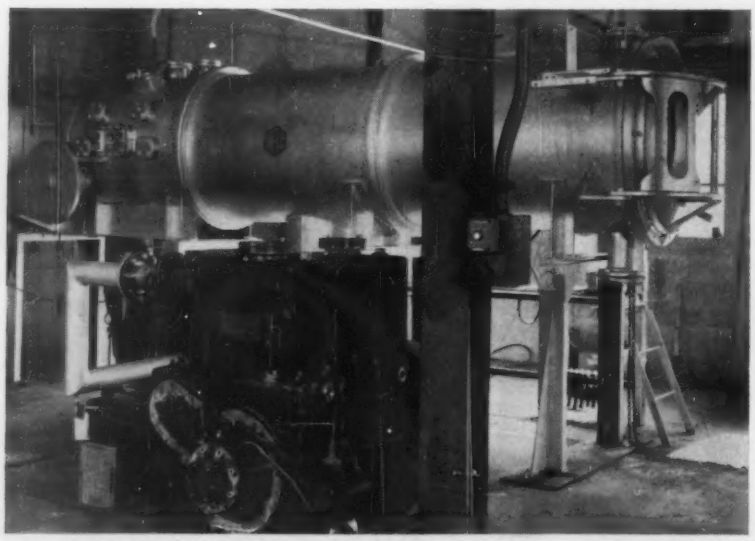
Materials handling — rotary, shelf, and belt dryers.

Water-vapor removal — static and rotary-scraped refrigerated condensers; mechanical and Roots blower pumps, latter with or without interstage condensing; and, steam ejector.

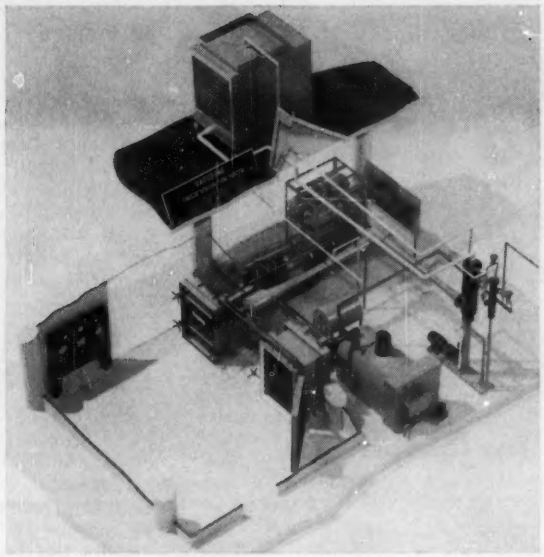
Heat-exchange—conduction, radiation, and dielectric devices.

Instrumentation — for gaging pressure, product temperature, moisture, and fat, etc. (422)

F. J. Stokes Corp. has been manufacturing all sizes and types of freeze-dryers for over 25 yr. As far back as '39, it freeze-dried various foods experimentally. Today, the company continues to conduct comprehensive cycle and



NRC'S BELT DRYER is pilot unit used to establish design criteria. Company's pilot facility also includes rotary and shelf dryers.



VACUDYNE'S BATCH-TYPE facility has been drying experimental batches for several years at Food & Container Institute. It's capable of modest commercial operation, yet retains laboratory versatility.

acceptance studies. Moreover, processors desiring to evaluate freeze-drying or prepare small quantities of a particular item for test-panel sampling are invited to use its facilities.

Stokes is developing production equipment with capacities ranging 1 to over 100 tons (wet basis) daily. It has worked with rapid-cycling techniques involving contact plates, spikes, microwaves, R-F, and accelerated heat input. Each technique, according to Stokes, imparts certain product defects as flavor loss, texture change, non-uniformity, poor reconstitutability, etc. However, company feels that continued research undoubtedly will resolve some of the problems.

Stokes has concentrated on cabinet-type equipment, with refrigerated condenser or direct pumping. A tonnage plant of this type removes a pound of water for 4-5¢. Cost includes installed equipment (amortized over 10 yr.), labor, power, and heat.

Directly pumped systems require lower capital investment, but have higher operating costs that offset the benefit. A refrigerated condenser system offers two possible advantages over direct pumping—flexibility and low drying costs after equipment is amortized. (423)

Vacudyne Corp. designs and builds equipment to suit users' specific requirements — particularly important, the company feels, in adapting equipment for efficient and economical production. It cites as an example a pilot plane capable of modest commercial operation while retaining lab versatility. Designed for Food & Container Institute, it has a 4-stage steam ejector that operates at 750 microns with dead end at 500 microns. At 750-micron level, moisture removal is 50 lb. of water and 5 lb. of air hourly. Barometric condensers use recirculated water to condense vapors, and plate temperatures range —20 to 300F.

Economy is a prime advantage of this system. Initial cost for instrumented, automated unit with boiler plant was about $50,000.

Another plus factor is minimum maintenance. There are no vacuum pumps, hydraulic systems, or electric components.

Finally, equipment can operate continuously, operating cost is reasonably low, and automatic controls take over once cycle is started.

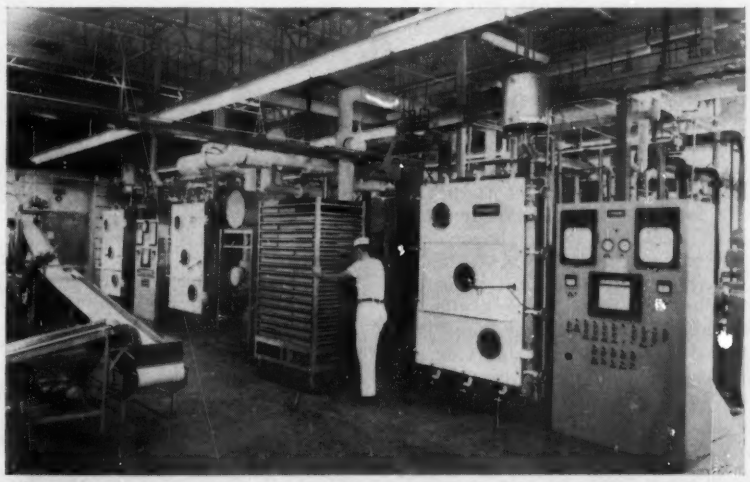
Cost of removing 1 lb. of water at 1 mm. is 0.033¢ for capital investment and 0.020¢ for operation —a total of 0.053¢. Calculation assumes $1 per 1,000 lb. of steam, 250 operating days per yr. and 10-yr. amortization.

Even so, this research unit hasn't been optimized for economy because the oversized evacuation system can handle two additional cabinets. And cost can be halved by more efficient use of steam.

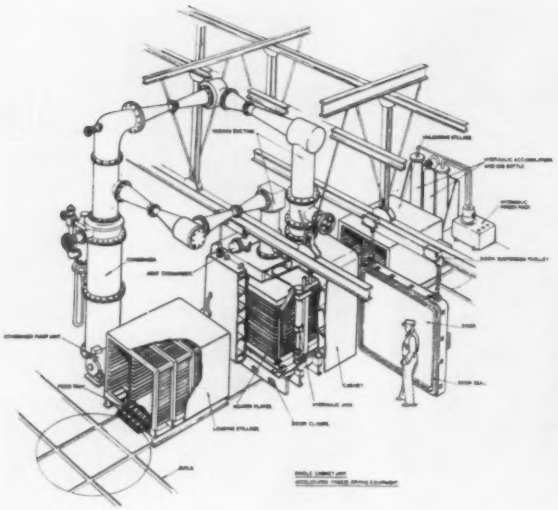
Vacudyne's A. N. Lederman feels that water can be removed in a commercial freeze-dryer for less than 2¢ per lb. He's even seen figures below 1¢, but won't attest to their accuracy. (424)

Foreign Units, Too

Atlas Co. of Copenhagen researched the three heat-trans-



BATTERY of Stokes freeze-drying chambers now quantity-producing freeze-dried mushrooms and chicken for soup mixes at Albion, N. Y., plant of Thomas J. Lipton.



VICKERS' ACCELERATED freeze-drying system cuts conventional process time to about one-third. Technique involves pressure contact and use of metal mesh between product and heating plates.

fer techniques—irradiation, high frequency heating, and contact heating. They decided contact drying was least complicated and easiest to control.

In this method, products are compressed between two movable heating plates that are suspended so pressure can be increased gradually from 0-10 psi. This technique can cut drying time for 1-in. thick fish fillets from 16-20 hr. to about 8 hr. (425)

Leybold-Hockvakuum-Anlagen, a German firm, has come up with a continuous freeze-drying system with automatic temperature control based on gaging ice temperature by its equilibrium vapor pressure. This eliminates need for thermocouples and, more important, controls heating by precise temperature measurement.

Process operates this way: Each carrier, suspended from an overhead monorail, has about 100 sq. ft. of loading surface. Carrier capacity varies, depending upon product, from 400-1,000 kg. per 24 hr. Each tunnel section holds four units, or about 1.5-4 tons per 24 hr. Usually, a drying tunnel is divided into three or four pressure sections, with barometric ice-temperature control in each.

Carrier is loaded and unloaded through airlocks on each side of tunnel. In some cases, there is a freezing section for a carrier between airlock and first drying section. This arrangement permits full use of system so that water vapor is removed from each section at constant rate. Either condensers or steam ejectors are employed to remove water vapor.

Where preferable, steam ejectors may be used for freezing and first two drying sections, and condensers for last drying section. (426)

Vickers-Armstrong of England has adopted an accelerated freeze-drying system that cuts process time to about one-third. A metal mesh is inserted between product and heating plates, which subjects foods to pressure over a larger contact area without obstructing vapor flow. To prevent product damage, pressure is applied after freezing.

Current equipment is suitable for batch processing. Each installation consists of a number of vacuum cabinets, each handling up to 1¼ tons of product per 24 hr. Production requirements can be met by using a sufficient number of cabinets and suitable auxiliary equipment.

Vickers has recently designed a continuous, accelerated freeze-drying plant handling 34,000 lb. (wet basis) daily. Proposed unit is intended primarily for processing pre-frozen meat or fish, but is equally suitable for fruits and vegetables as peas, root vegetables, black currants, etc. (427)

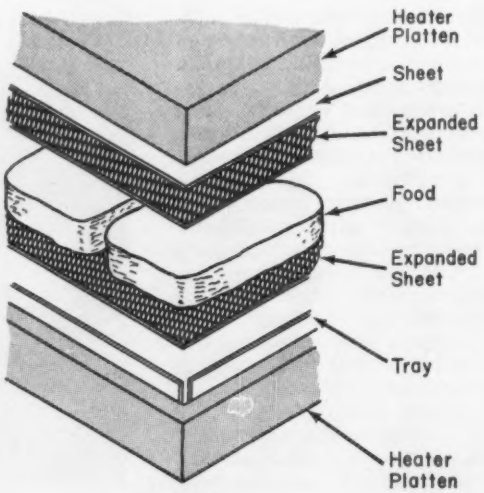
Continuous Processing?

Continuous vacuum-drying of liquid concentrates has been successful with Chain Belt equipment for example. And G. W. Bard of that firm points out that a similar technique can handle solids. This despite the fact that drying rate is limited by energy penetration into discrete solids and by diffusion of water vapor from the interior of ½ to 1-in. thick products.

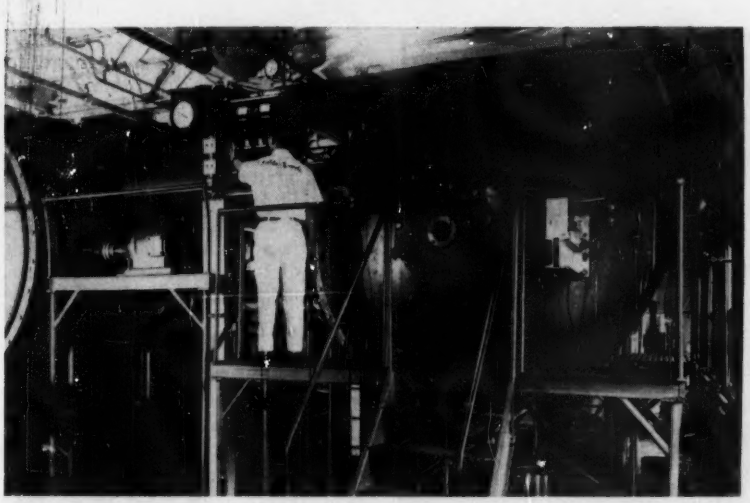
Bard feels an approach to lower-cost continuous freeze-drying should include:

1. **Newer energy techniques.** Suggested are combinations of microwave methods now being studied at U. of Calif., radiant heat from platens, and pressure-contacting (Ministry of Agriculture, Fisheries, and Food, Aberdeen, Scotland).

2. **Maximum production.** Such a dryer would operate continuously, fully charged, with its vacuum system under constant maximum vapor load.



CLOSE-UP of accelerated freeze-drying assembly shows metal mesh between product and plates before pressure is applied.



CHAIN BELT visualizes using this continuous vacuum dryer for freeze-drying. Currently it vacuum-dries liquid concentrates. Proposed chamber would have up to eleven conveyor levels for total travel of 473 ft.

Bard assumes the dryer will be similar to his company's present continuous vacuum unit (12x52 ft.). Its chamber could house up to 11 conveyor levels (5x43 ft.) with total surface of about 2,360 sq. ft., and total travel length of 473 ft.

Here are some production data:

Initial cost—not over $350,000 (present cost of continuous vacuum dryer).

Vapor-handling capacity — 394 lb. per hr. assuming a 6-hr. cycle and belt loading of 1.25 lb. per sq. ft.

Output—about 98.5 lb. per hr. of dry product.

Yearly production—some 591,000 lb. of product (schedule of 24 hr. a day, 5 days a week, 50 weeks a yr.).

Obsolescence hazard for this dryer won't be any greater than for a shelf dryer. Any breakthrough in energy penetration into product or water removal therefrom could be applied.

According to Bard, here is how the proposed unit compares with a battery of shelf dryers in:

Capital cost for equivalent drying area — probably the same. FMC's Abbott estimates $60,000-$75,000 per plant module. A continuous unit is equivalent to five modules.

Labor and time saving—may be realized in loading and unloading the continuous system and through elimination of non-productive evacuation.

Pumping cost—constant vapor load in a continuous system would make more efficient use of evacuating equipment. Entry and discharge hoppers require a considerably smaller roughing system.

Process uniformity — drying cycle in continuous unit would eliminate process supervisory personnel or elaborate cycle controls. Ability to profile energy enables use of most effective source of heat at proper intensity in each drying stage.

Product uniformity — probably greater in continuous system. (428)

Pointers on Processing

As with any processing technique, freeze-drying has its "do's and don'ts."

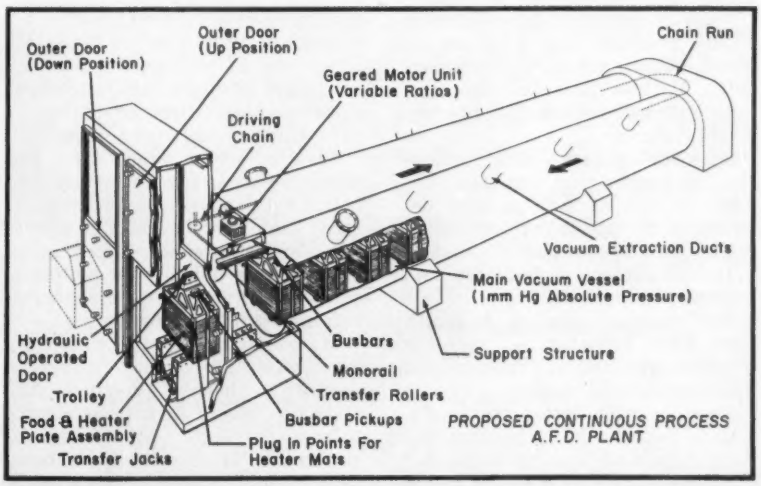
For example, products must be properly frozen or ice-crystal growth may damage structure and change texture when items are reconstituted. Slow freezing 'grows' large ice crystals that may fracture ice-retaining fibers or cells, rendering some reconstituted products tougher.

Not recommended is freezing a product in freeze-dryer prior to drying cycle. Such freezing takes longer, and it's poor economy to tie up a relatively expensive unit.

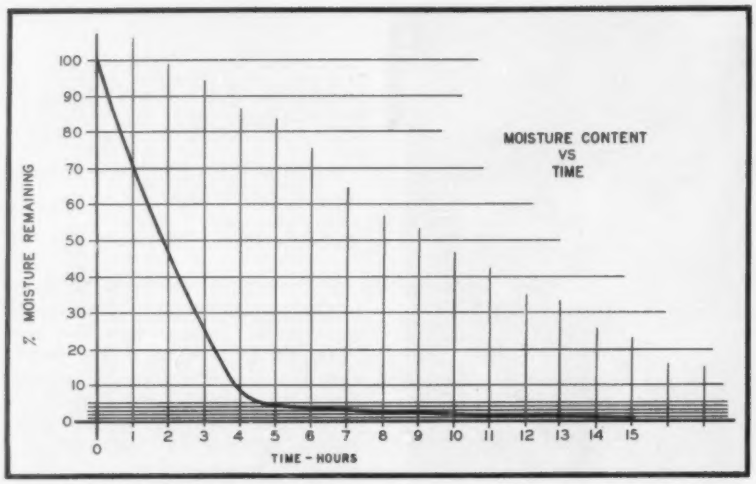
Vapors must be removed immediately and uniformly from around product and from chamber during drying cycle. Otherwise, areas of high vapor pressure may promote localized melting. Although product may later re-freeze or dry from liquid state, its texture will change and cells may collapse. Such portions of the food will not reconstitute properly.

It's also important to heat products uniformly to avoid melting and variation in drying rate at different areas.

A freeze dryer's vacuum system must be reliable and have adequate capacity. At the worst, a fluctuating or overloaded vacuum



VICKERS' proposed continuous accelerated freeze-drying plant would handle about 34,000 lb. of wet product daily.



DRYING-RATE GRAPH indicates that removing last 10% of product moisture is by far the most time-consuming and costly part of the process.

system can ruin an entire batch. At the least, it will damage portions of a product so they do not reconstitute to desired quality.

The relatively long drying time is a prime economic problem but, as pointed out by Vacudyne's A. N. Lederman, there's little indication that shorter drying cycles enhance quality. In fact, there's little, if any, quality change in most products whether processed 8 or 20 hr.

How about cost? Of course a 10-hr. drying time is more economical than a 20-hr. one. But moisture removal by freeze-drying also involves such costly items as energy to operate vapor-removal system, as well as amortizing and maintaining equipment.

One attempt to cut drying time relies on microwave or radio-frequency energy to generate heat within products' wet portions instead of its transfer from outside. Method is successful, but cost outweighs increased production savings.

Another approach uses conduction to hasten heat transfer. It's done by sandwiching product between two plates of expanded metal, then hydraulically pressing a heated surface against top and bottom of "sandwich."

Still another technique to facilitate heat transfer is impaling product upon spiked plates and applying heat to them.

Trouble with latter two methods is possibility of product deformation and loss of consumer acceptance. And the additional equipment required defeats the purpose. Lederman feels that the most economical approach at present is to add cabinets to a vacuum system. They are cheap, require practically no maintenance, and reduce operating costs by maintaining a constant load on vapor-removal system.

The optimum is a continuous system, although none has been built to handle all products.

The slow, costly part of freeze-drying is getting the small percentage of residual moisture out of the product. If products could tolerate a higher moisture content (say 7-8%) instead of the 2% required to control browning, drying might be more attractive.

The low rate of moisture removal is due to difficulty in transferring sublimation energy to frozen products. During freeze-drying, the ice phase recedes inside product and is surrounded by a layer of porous dried material. Thus, heat of sublimation must be conducted through this insulating layer, and water vapor must escape through the same layer.

Flow of water vapor from ice phase depends on difference between total pressures at ice surfaces and that in vacuum chamber. Diffusion effect is negligible at pressures usually encountered, even with a chamber employing a refrigerated condenser.

Major factor governing rate of evaporation in freeze-drying is product's thermal conductivity. Heat input can't be increased sufficiently to limit permeability or resistance to flow because temperature differences through products are limited by their susceptibility to heat damage.

However, if this heat flow could be increased without damage to product, equilibrium temperature could be maintained below freezing in most products of usable size — thus enabling evaporation rates many times that possible in conventional freeze-drying.

This is why Harper and Chichester at U. of Calif. are looking into dielectric heating to introduce large amounts of energy independently of thermal conductivity.

Here, heating is proportional to frequency, peak-voltage gradient, and dielectric loss factor. Latter is a characteristic of the product, and must be determined for each item. Many frozen products have a loss factor several times that of crystalline ice—an advantage in freeze-drying.

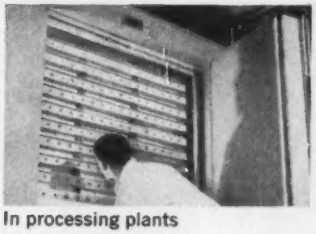
Packaging Problems

Protection against vapor and gas transmission is important for storage stability. Thus, best current practice appears to be canning or packing in foil laminates, under vacuum or inert-gas pressure.

Most laminates don't have the strength to prevent puncture by freeze-dried meats. Alternate methods have been tried with little success. Canadian researchers have used paperboard sleeves or cartons to separate meat from barrier material. But they add bulk and weight, and absorb fats if not specially treated.

Incorporating a cushioning layer within laminates, they also learned, doesn't work because of compression-collapsing. Use of top and bottom pulp board sheets was an improvement, though at the expense of puncturing. A telescoping carton enclosing meats gave better results. Combinations of cellulose acetate-aluminum foil-vinyl film and mylar-aluminum foil-pliofilm weren't satisfactory, unless used in conjunction with a carton protector.

Acknowledgment: The author expresses appreciation to the following for their assistance in preparation of this report: H. P. Furgal and C. K. Weisman, Armour and Company, Chicago; Ettrup Peterson, A/S Atlas, Copenhagen, Denmark; Gerald Bard, Chain Belt Co., Milwaukee; J. A. Abbott and Erik Thuse, Food Machinery & Chemical Corp., San Jose, Calif.; J. H. Hulse, Defense Research Medical Laboratories, Toronto, Canada; G. W. Oetjen, Leybold-Hockvakuum-Anlagen, Germany; Ray Reubelt, Liana, Inc., San Carlos, Tex.; Edward Seltzer, Thomas J. Lipton, Inc., Hoboken, N. J.; M. C. Brockmann and F. P. Mehrlich, Quartermaster Food and Container Institute for the Armed Forces, Chicago; Paul W. Patton, NRC Equipment Corp., Newton Highlands, Mass.; John F. Maguire, F. J. Stokes Corp., Philadelphia; A. N. Lederman, Vacudyne Corp., Chicago; S. E. H. Lefever, Vickers-Armstrongs (South Marston) Ltd., England; C. O. Chichester, University of California, Dept. of Food Science & Technology, Agricultural Extension Service, Albany, Calif.



In processing plants

Accepted!

Preferred!

Performance-proved!

In "reefer" trucks or cars

In "cold rooms"

Insist on

genetron®

super-dry refrigerants

to help assure 0° or less for your frozen foods

In storage lockers

In display cases

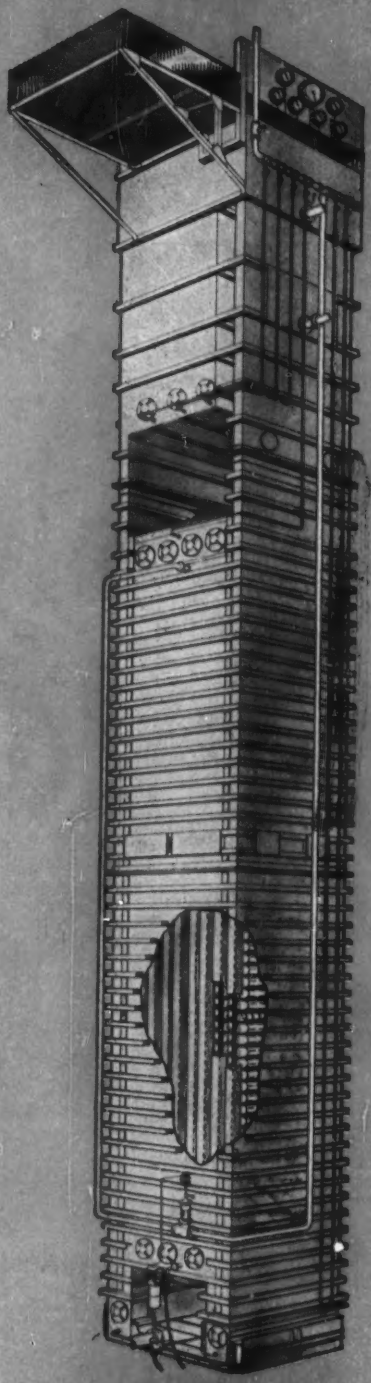
General Chemical's advanced manufacturing techniques have helped bring new quality standards . . . new highs of purity and dryness for refrigerants. "Genetron" refrigerants are approved . . . accepted . . . *preferred* because they're performance-proved as original charge and replacement in all types of modern refrigerating equipment. Available from leading wholesalers coast to coast. Insist on "Genetron" super-dry refrigerants from your wholesaler.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N.Y.

Now, from France, for your plant and profits

. . . a sensational (and proved) saving step in canning!



For a long time, continuous pressure cooking and cooling presented many problems in mechanics and heat exchange. *But now, a revolution from France!* Introduced just a few years ago, the genuine CARVALLO hydrostatic continuous cooker and cooler has been constantly tested, refined and improved. Today, it is considered the finest unit in the world, matching your own product quality standards.

Only the genuine CARVALLO hydrostatic pressure cooker-cooler gives you these exclusive features . . .

1. **Preheating and Cooling under Integral Counter Flow** saves up to 80% in steam and cooling water.
2. **Fully Automatic Self-controlled Unit,** directly coupled to seamers and labelers or casers, saves 100% in processing labor.
3. **Specially Designed Chains** are rugged, durable. Do not stretch or wear. The end of the carriers are closed by the chains, preventing jamming and lateral friction and damage to the cans and jars.
4. **Hydrostatic Controlled Pressure** insures an absolutely constant temperature during sterilization, eliminates transfer valves and all their troubles. Pressure variations inside and outside of cans are progressive! No exploded peas! No clouded juices! No leaking seams!
5. **Tubular Carriers Unattached to the Conveying Chains** — the same unit can process, without any change parts, cans, jars or bottles in a wide range of sizes and shapes. No jamming through dented cans or broken jars. Easy automatic loading and unloading. Carriers can be removed very quickly for yearly inspection.

Air mail or cable . . .

MAISON FRÉDÉRIC FOUCHÉ

Food Machinery Department
3, route de Saint Denis,
LA COURNEUVE (Seine)

Built in FRANCE by: Maison FREDERIC FOUCHE 8, rue Eugene Varlin, PARIS 10e
Patented and technically directed by: Pierre CARVALLO 24, villa Dupont, PARIS 16e

Marketing Signals

Belt-tightening disputed . . .

Non-foods plateau . . . Why

Campbell, Pepperidge

Farm merged

Tremor, But No Quake

Following the pattern of the past 2 yr., consumers did a little belt-tightening on food-beverage spending in the third quarter this year. Outlays in the July-Sept. period dipped 0.8%—from $81.4 billion (annual rate) to $80.7 billion.

This decline came as a surprise to industry considering that 3rd quarter sales of food stores increased 3.1% and volume of eat-drink places rose 2.9%. Also, food prices were up 0.5 points. The above figures, however, are not adjusted for seasonal differences. Adjusted data show food store sales off 1.4%, eat-drink volume down 2%.

Marriage of "Convenience"

Campbell Soup-Pepperidge Farm merger answers basic needs of both firms. Like many old-line canners, Campbell has long aimed at getting deeper into newer types of convenience foods—where profits are fatter, rate of gain faster. **Pres. W. B. Murphy has said "convenience foods' growth the next 10 yr. will be more than double that of food in general."**

Disclosure of Pepperidge Farm sales and profits offer a clue to that firm's action. Net was 4.0% of volume for the last fiscal year—respectable enough for the baking field, but much less than what you'd expect from the retail prices of the firm's specialty-type items. It's probable that the company's privately-owned base became pinched as stepped-up competition, and the need to counter with bigger marketing budgets, squeezed financial resources.

Saturation Point for Non-Foods?

Some of the steam may be going out of the non-foods boom if findings of the Super Market Institute's 12th annual report are a gage. Product category took 5% of SMI members' sales in '59, same level as for the previous 3 yr. **More significantly, middle half of respondents reported ranges of 3.2% to 6.5%—lowest since '56.**

Other SMI findings: Typical super now sells 6,000 items (including 4,300 dry groceries); 36% of member firms use buying committees; and average company dropped 150 items for every 200 new ones taken on.

Impulse Sales Bring Mixed Blessings

More than two thirds of food store customers do their aisle-trekking without benefit of shopping list. But shoppers armed with such lists spend more time and more money per minute in the store.

This mixed picture of the power of impulse sales are among the findings of a new USDA research project which focused on the shopping patterns of more than 3,000 customers in 13 Boston supermarkets. First of a series of articles detailing the findings appears in Dept.'s Nov. "Agricultural Marketing."

Aerosol Foods: Unfulfilled Promise

Pressurized foods should see more rapid expansion in the Sixties than in the past decade. So declared W. E. Graham, Clayton Corp., at last month's Packaging Institute meet. He pointed out such items now have annual volume of 90-100 mill. units vs. 30 mill. 12 yr. ago. Aerated toppings alone account for 80-90 mill. units, he said.

Two important keys to future expansion are product formulation and filling speeds, Graham observed. He urged "greater confidence in promoting more sophisticated aerosols such as liquid drinks, syrups which dissolve instantly, salad dressings which blend smoothly, light fluffy spreads which apply quickly and evenly." Because of gassing techniques, maximum filling speeds obtainable today are 120/min., he said.

Economics of pressurized packaging, he added, make it "very difficult, if not impossible" to sell an aerosol food at a retail price below 49¢.

Upright Freezers Stretch FF Space

Biggest beef retailers have against frozen foods is wasted air space over horizontal freezer cabinets. Long sought have been vertical cases that would use up the space, take less floor room. Two Chicago-area independent chains (Sure-Save and Convenient Food Mart) are now trying out upright freezers, report that in some stores sales of frozens have soared 40%.

Close to 24 units (made by Room-Temp Locker, Tacoma, Wash.) are being used by the retailers. Sizes vary among the cabinets—from 2 to 20 doors, 2 to 6 tiers. Sure-Save says it has been able to increase its frozen food line because the units give more capacity at less floor space.

BRIEFS

Retailer requests for food maker participation in anniversary and other type "sales promotions" have dropped off since FTC began its industry probe, trade sources report.

Instants account for 5% of all servings of mashed potatoes in the country, says R. T. French Co. Retail volume is now $30 mill., company adds.

Importance of recipe information is stressed in new, persuasive General Foods Kitchens movie that's aimed at opinion-molding groups.

Plastic Box Protects . . . Shows Off Product

Radical forming technique sets up trays on packing line without use of heat or adhesives. Made of low-cost styrene, transparent containers safeguard product quality, enhance salability

A TRIO of handsome benefits—better product visibility, greater product protection, and fewer returns of damaged goods—are promised by a new breakthrough in plastics packaging. The latest development, plastic folding boxes, is the result of a new cold-forming technique that corner-locks polystyrene trays without the use of either heat or adhesives.

Using unscored die-cut blanks, forming equipment (specially developed) has a capacity of up to 100 boxes/min. depending upon carton size. Likely markets for the plastic carton include produce items, baked goods, dairy, meats, seafoods, confections, and macaroni —in fact, any product that benefits from transparent packaging with maximum no-crush protection.

Off The Ground

First users in this country are Schulze-Burch Biscuit Co., Chicago, for sandwich cookies, and California Date Growers Assn., Indio, Calif., for date packs. Two Canadian firms are putting up produce items in the plastic trays.

At Cal Date, the semi-rigid trays (1½x4½x8¼ in.), made from 10-gage die-cut blanks, are turned out at nearly 100/min. They're being used for 1½ lb. packs of unpitted dates, 1⅜ lb. of pitted variety.

The installation climaxes Cal Date's long search for a package that would combine strong product protection with in-store merchandising impact.

Overwrapped paperboard boxes, which the firm still uses, provided adequate protection, but lacked "see-through" appeal of former cellophane or polyethylene bags. The sacks, in turn, fell down on protection, since dates crushed easily and syrup collected into a sticky mess.

Any attempt to solve problem by reducing moisture content brought consumer outcries of poor quality. Company's solution lay in controlling product moisture (best at 22-25%) by steam-room curing, and packing dates in overwrapped trays (paperboard and styrene).

Operations involve three tray packing lines—one for plastic, two for paperboard. All lines combine conventional manual filling and check-weighing, along with automatic overwrapping of date-filled trays (see photos). Paperboards are overwrapped with single cellophane sheets, plastic with reverse-printed double cellophane.

West Coast firm reportedly packs about 50% of the dates put up in this country. About 75% of Cal Date's output goes to retail outlets, the rest to food processors.

How Trays Came About

Unique plastic box is the result of a 4-way cooperative effort by Chas. E. Palmer & Associates (package designer), Somers, Conn.; R. A. Jones & Co. (equipment maker), Covington, Ky.; Plax Corp. (film supplier), Hartford, Conn.; and Monsanto Chemical Co. (resin producer), Springfield, Mass.

Cold - forming tray machines (Jones) can be leased for 3-yr. periods or purchased for around $18,000. They reportedly handle boxes ranging from ⅞x2x2½ to ¾x7x11 in. at 80-100/min.

Size changeover is accomplished by removal or replacement of preset folding parts. Tray changeover time depends upon number of required dimension changes, together with relationship of carton dimensions. Approximate changeover time: 20 minutes.

(Continued on p. 70)

UNPRECEDENTED OFFER!

Mail coupon for free Red Star expert

Our men don't travel by parcel post, but if you think we're joking about sending a technical man, you are absolutely wrong.

We have a wonderful new product which must be actually tried to be appreciated. It is Tora Food—our name for our superb, primary-grown Torula Yeast U.S.P.

Tora Food has an amazing ability to accentuate and improve natural flavors. So chances are very good that it will improve the flavor of your products.

Tora Food also is a powerful nutritional booster—able to add this kind of sales appeal to a wide variety of products at very low cost.

Will you mail the coupon, so that we can arrange to have a technical man discuss Tora Food with you? You run no risk, and you'll be under absolutely no obligation. Just mail the coupon today—we'll do the rest!

TORA FOOD®
by Red Star
Yeast & Products Co.
MILWAUKEE 1, WISCONSIN

RED STAR YEAST & PRODUCTS CO.
DEPT. FE2, MILWAUKEE 1, WISCONSIN

Sure, I'd like to find out how Tora Food will improve our products.

- ☐ Please arrange a session with your technical men.
- ☐ Please send me a complimentary sample of Tora Food.
- ☐ Please send literature.

NAME_____

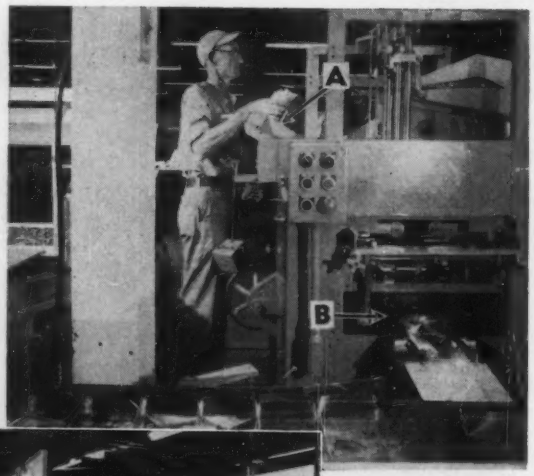
TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

1-2-3 of Plastic Tray-Forming



DIE-CUT BLANKS of biaxially oriented polystyrene are fed into magazine (A) of tray-former. Set-up trays are then discharged to packing line (B) at speeds up to 100/min.

DATES travel from inspection station (A) to loading conveyor (B) where they're manually packed into open-top plastic trays. Two different size containers are used for pitted and unpitted fruit.

FILLED TRAYS are check-weighed and routed to wrapping machine that applies reverse-printed laminated cellophane overwrap.

Sold under the trade name "Plasti-Lok," tray incorporates an exclusive Palmer-designed cold-forming technique for "locking" die-cut blanks, and creasing and bending the oriented sheeting to prevent cracking or crazing. This method bypasses adhesives which tend to "cloud" tray appearance, according to Palmer. Once locked, tray won't open, except when end dimensions are distorted or tray destroyed. Paperboard, put to similar distortion, would fracture and prevent effective locking, Monsanto says.

During forming stage, sheet is creased against a cushioning surface and confined while folding. Creasing is done as forming mandrel's beveled edge forces registered plastic blank against a foam-rubber covered rotating bar. Blank then proceeds to another folding station, where a similar mandrel does the right-angle bending and side-locking.

Nature of the Material

Lock takes advantage of the plastic's inherent properties—distorting to a degree during tray-forming that highest-quality paperboard stock can't tolerate. As sheet is distorted, male-to-female locks are engaged so that, once the tray resumes its undistorted condition, end closures are permanently secured.

Result is a right-angle fold without evidence of fractures. After tray has been filled, top is formed into a rounded, flat, non-curling tab-locked package that's finally machine-overwrapped.

Plax two-way stretches extruded polystyrene under controlled temperature until it is biaxially oriented to triple its original length and width. This high yield (nine times original area) and oriented styrene's specific gravity (1.05) help to reduce material cost. Moreover, two-way stretched material has the workable toughness and rigidity of other heavier gage plastic sheeting.

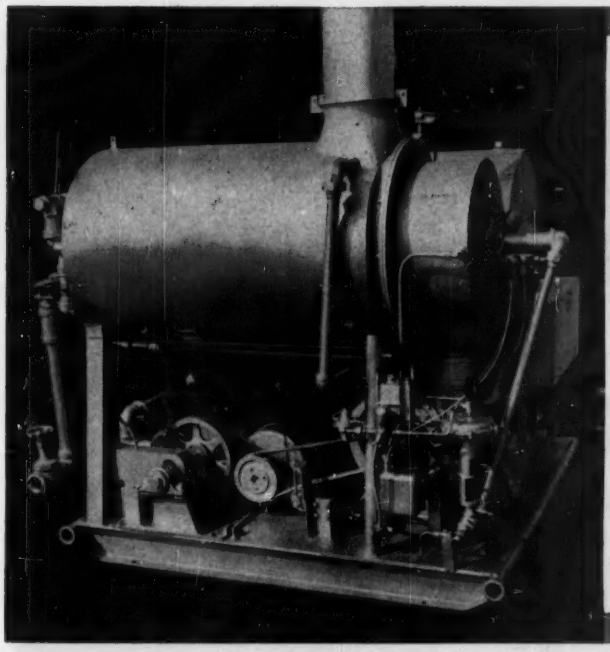
Good machine-handling properties are cited for the material by Plax. To some extent, oriented sheet "flows" as it is formed into a tray. And, when once bent beyond plastic's elastic limit, material doesn't return to its pre-folded state. Supplier also states that sheeting is odorless, tasteless, and non-toxic; has excellent aging resistance; holds up against water, grease, acids, and alkalies; is produced in clear (glass-like clarity), translucent, and opaque colors; and takes commercial printing.

Weyerhaeuser Co., one of several firms licensed to sell Plasti-Lok, says die-cut styrene blanks (0.010-in. gage) costs twice as much as paperboard. Also, that they run about half again as much as window-type paperboards.

Company points out that as with other new package developments, future of plastic cartons will depend upon users' willingness to pay for added sales impact of completely transparent tray. A Monsanto spokesman observes that "the history of the plastic industry shows sharp price reductions in materials as volume increased."

(End)

Vapor Heating Corporation announces their



VAPOR MODULATIC®

HI•R•TEMP

LIQUID PHASE HEATER

- Higher Temperatures
- Lower Pressures
- Lowest Installation and Operating Costs
- Least Maintenance
- No Water Treatment

The Vapor Modulatic HI-R-TEMP Liquid Phase Heater is a forced circulation, coiled tube, direct-fired heater of two-pass design. It provides dependable, automatic, accurately controlled heat transfer up to 600°F. at low pressure. Burns natural gas, propane, butane, No. 2 Diesel oil, or kerosene. Ideal for use in oil refineries; in concrete, chemical, plastics, food, plating industries; for oil or sulphur tankers...or wherever high temperatures are needed *without* high pressures.

check these advantages:

- **FULLY AUTOMATIC OPERATION.** Modulating controls automatically maintain predetermined temperature of heat transfer oil.
- **NO WATER TREATMENT NEEDED.** Eliminates cost of treatment system. No scale deposits, corrosion, freezing problems.
- **LOW PRESSURE VESSELS AND FLOW CIRCUITS.** No heavy piping, fittings or valves required.
- **LOW OPERATING COST.** Forced draft combustion, efficient coil design gives highly efficient operation.
- **LOW INSTALLATION COST.** Completely unitized and skid mounted with all piping in place, factory tested before shipping. Compact, lightweight, installs anywhere.
- **POSITIVE OIL FLOW.** Rotary gear pump assures uniform circulation...prevents hot-spots, coking, sludging, oil breakdown.
- **OPTIMUM SAFETY.** Built to ASME codes. Flame failure, low oil level, high temperature safety shut-off controls are standard. CO_2 quenching ring optional.

BRIEF SPECIFICATIONS

	Model No. 5410	Model No. 5425	Model No. 5435
Thermal Capacity BTU's per hr. input	1,250,000	3,120,000	4,375,000
Fuel, Gals/hr. No. 2 Fuel Oil	9	23	32
Fuel, Cu. Ft./hr. Natural Gas	1,250	3,120	4,375
Heating Surface Square Feet	109.7	130	170.4
Stack Diameter	10"	10"	10"
Length, overall	60"	83"	96"
Width, overall	36"	36¾"	53"
Height, overall	56½"	65"	63"
Shipping Weight, lbs.	2,000	2,700	3,700

Please send me free HI-R-TEMP bulletin no. 4023

VAPOR

VAPOR HEATING CORPORATION, 59L
80 E. Jackson Blvd., Chicago 4, Ill.

NAME_____

TITLE_____

FIRM_____

ADDRESS_____

CITY, ZONE, STATE_____

DOW | announcing VERSENE CA

CONTROL SPOILAGE LOSSES WITH NEW DOW CHELATING AGENT

A NEW APPROACH to problems caused by trace metal ions in food is now available. Versene® CA chelating agent is calcium disodium EDTA (calcium disodium ethylenediaminetetraacetate dihydrate)—a product developed specifically for the food industry. It chemically inactivates troublesome metal ions such as iron, copper and nickel. Such ions, unless controlled, can cause formation of undesirable precipitates and complexes and catalyze oxidative degradation.

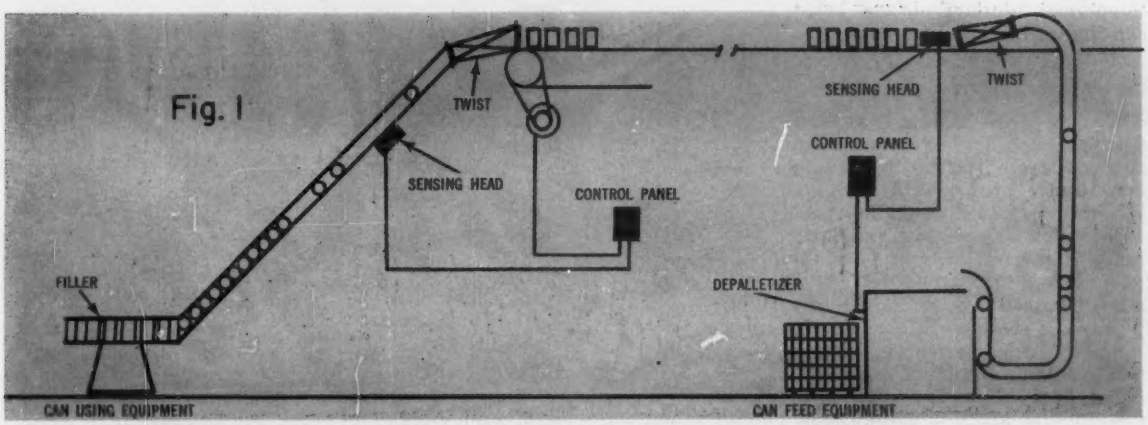
UNWANTED PRECIPITATES AND COMPLEXES are widely encountered in food products. Insoluble, needle-like struvite crystals frequently form in canned seafood, decreasing customer acceptance. Complexes of heavy metals appear to be a cause of "gushing" or "wildness" in beer and cloudiness and sedimentation in wine. Versene CA chelating agent solves both these problems. In addition, it may be utilized to eliminate the undesirable blackening caused in cauliflower, asparagus, and potatoes by iron complexes.

RETARDATION OF OXIDATION with Versene CA is an excellent method for stabilizing flavors and odors and thus extending the shelf life of food products based on fats and oils. Inactivation of metal ions not only eliminates the catalytic effect of the ions on the oxidative process, but also enhances the effect of anti-oxidants such as ascorbic acid. Versene CA has been shown to eliminate the white ring which commonly forms on the surface of French dressing during storage. Retardation of oxidation extends the shelf life of mayonnaise, salad dressing, margarine, nutmeats, and similar products.

FDA REGULATIONS on the use of Versene CA in sandwich spreads, malt beverages, and in non-standardized sauces and dressings were published in the August 4, 1960 issue of the FEDERAL REGISTER. Further regulations under the Federal Food, Drug and Cosmetic Act are expected to permit the use of Versene CA in other food products.

FOR FURTHER INFORMATION and samples write Technical Service and Development, THE DOW CHEMICAL COMPANY, Midland, Michigan, Department 605KE12.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN



SENSING HEADS provide overload and underload protection, curb jams. To control filler, sensing head stops in-feed equipment when cans back up beyond a certain point, also stops filler if in-feed conveyor runs out of cans. To prevent jams, sensing head beyond outlet of can elevator (right) actuates can stop at in-feed to elevator.

Can-Line Control Curbs Bottlenecks

New systems concept keeps supply lines full, stops cable-cutting of cans, cuts maintenance costs

JUST A SECOND'S DELAY on a 720/min. can line—and 12 cans of product fail to show up on production records.

With bulk-handling systems now discharging 750-1,200 cans/min., it's obvious that even short line stoppages are too costly to be ignored. Fortunately, latest can-line controls based on a 'systems' approach to the problem minimizes these losses by:

1. **Preventing jams** and keeping can-supply lines full regardless of fluctuating production.
2. **Curbing cable-cutting** of cans and damage to lithography.
3. **Cutting maintenance** costs by phasing out excessive start-stop jogging of lines.

A critical survey of cause and effect, from which the systems concept evolved, disclosed, for example, the need for efficient feeding of can lines from high-speed unscramblers and depalletizers.

Applying this concept to bulk-handling systems, an air elevator was developed. Equipment consists of a blower and vertical duct. Cans entering the duct are gently transferred in an air stream whose velocity reaches 60 mph. in some installations. Both elevators and runways are easily adjustable for can sizes.

Moreover, the unit needs little or no incline from the discharge point—if an air runway section is attached at this point. This feature achieves added headroom.

Time-Delay Controls

Although air-handling solved the problem of high-speed can transfer at the critical point, other problems were apparent during the systems analysis.

Production demands on existing lines and control methods exceeded their limit of efficient operation. In addition, short stoppages in fillers or other equipment far ahead of depalletizers now had an accelerating effect on jamming as cans backed up faster and farther in the lines.

A partial answer was lengthening the lines with circuitous loops and return runways to provide added surge storage. This required considerable investment, advance planning, and installation labor. It also increased maintenance problems.

Required was a dual-acting control system that would: (1) automatically supply this surge capacity in existing lines; and (2) keep lines full at all times, ready to supply cans the moment production resumed.

Considering the entire plant can-flow pattern, existing on-off controls lacked an additional important feature—time-delay functioning. Without proper timing control, there was no substitute for human attention whenever simple on-off action was insufficient. Control of "cable burn" offers a simple example: During stoppages of can-using equipment, cable lines continue running. If stoppage is lengthy and operator fails to turn off cable motor, the moving cable cuts into bottom flanges of backed up cans. This cutting action can wear through the metal, causing a microscopic opening through which spoilage bacteria can enter after processing.

Problem was solved by control with internal timing devices. Its time-delay mechanisms ignore stoppages lasting up to several seconds. If cans resume normal flow before this, no control action is taken. If timing runs out, the cable (and other desired equipment) is stopped.

Adjustable time delay on both

E. R. DUDLEY
President, Peco Corp., Mountain View, Calif.

'Stop' and 'Restart' delays keeps can lines filled at all times.

Proximity Control

Moving cans—especially at high speeds—are tricky elements, and any subtle obstruction in the line can cause unsuspected trouble. The ideal control would offer no obstruction to can flow and have no moving parts to wear or maintain. It would not be affected by moisture, dust, air, or light—only by cans.

The sensing element is located at the side or bottom of a runway, about ¼ in. from the cans. It is housed in a plastic-encased head, and time-delay elements are contained in a compact, splash-proof panel which can be located remotely.

Simpler models prevent jams, and offer overload and underload protection in the line, as illustrated in Fig. 1.

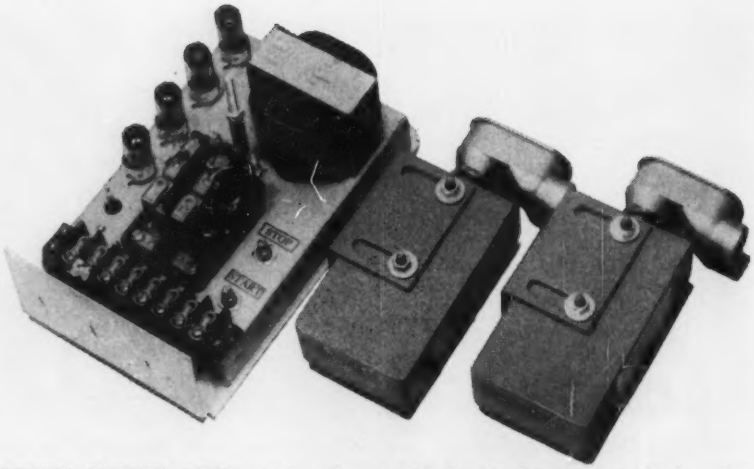
A somewhat more complex system (Fig. 2) controls delivery of cans from depalletizer to several fillers simultaneously via the merry-go-round distribution cables shown.

This merry-go-round recycles surplus cans whenever they back up to Sensing Head B, which in this case, controls two 'Stop-Restart' functions. If only a single-function control were used, cans from the in-feed gravity line would converge with those coming from the surplus storage section of the merry-go-round. When this happens, cans jam at the converging point.

Here's how this problem was solved: When cans back up to sensing head (B), the first control stops cans from entering the gravity in-feed line by activating can stop (C). Second control, after suitable delay, then opens can stop (A), and allows accumulated cans to re-enter the supply section of merry-go-round.

After backed-up cans clear the sensing head, a time delay action begins. This allows all backed-up cans to clear the in-feed point. Next, can stop (A) re-closes, then can stop (C) reopens after a suitable interval, and normal flow from the depalletizer line resumes.

Another type of proximity control senses the actual motion of cans, rather than the slight voids between moving cans. This eliminates or drastically reduces the normal re-start lag, which is cumulative between successive units of equipment throughout line.



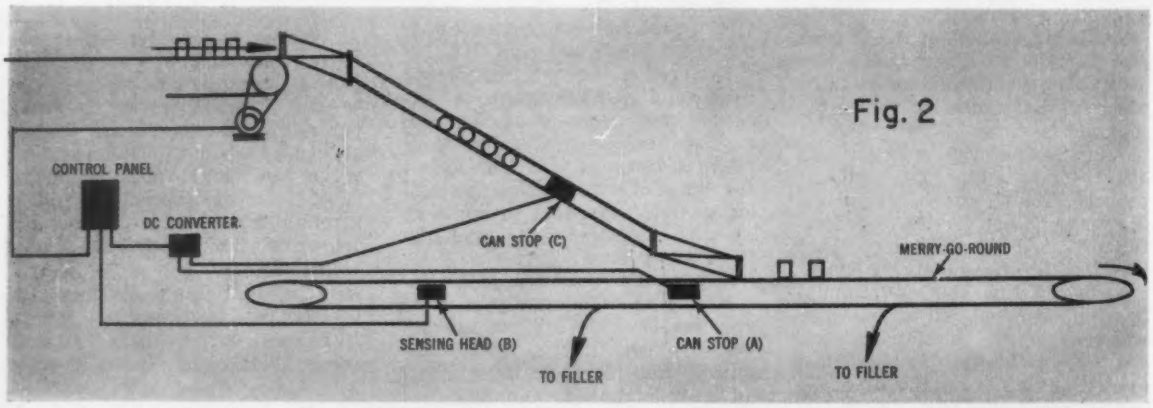
TYPICAL CONTROL UNIT combines two sensing heads. One stops in-feed equipment when cans accumulate, the other re-starts the equipment when normal flow resumes.

Dividing Flowing Cans

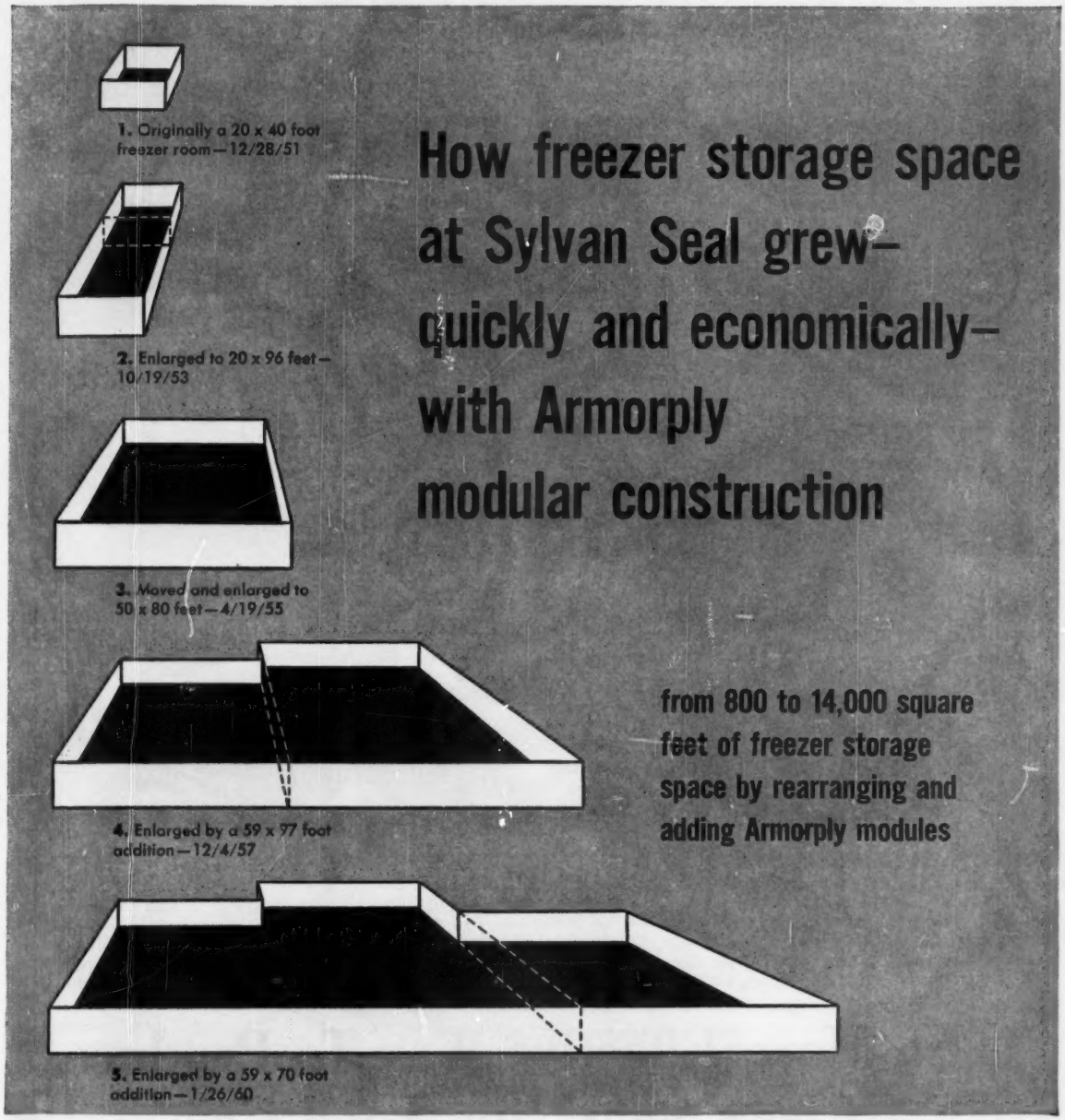
As can speeds climbed, another stumbling block to line automation was distributing cans from main lines to trunk lines.

An electromagnetic can divider with no moving parts meets this problem by feeding cans into either of two lines on demand. When both branch lines are full, it automatically stops the in-feed system until more cans are demanded. Either line can be set to receive prior demand through an adjustment in the panel board.

Also available are two types of can stops, one using magnetism to stop and hold cans along a magnetized section of the runway, the other induced magnetism to actuate a hinged arm which stops flow of cans. (End)



SIMULTANEOUS CONTROL of can delivery to several fillers. When cans back up to sensing heat (B), can stop (C) keeps them from entering gravity in-feed line. After pre-set time delay, a second control opens can stop (A) allowing cans to re-enter the merry-go-round. After backed-up cans clear sensing head, time-delay action permits them to clear the in-feed point. Then, can stop (A) re-closes, can stop (C) re-opens after a suitable interval, and normal flow from depalletizer resumes.


1. Originally a 20 x 40 foot freezer room—12/28/51
2. Enlarged to 20 x 96 feet—10/19/53
3. Moved and enlarged to 50 x 80 feet—4/19/55
4. Enlarged by a 59 x 97 foot addition—12/4/57
5. Enlarged by a 59 x 70 foot addition—1/26/60

How freezer storage space at Sylvan Seal grew—quickly and economically—with Armorply modular construction

from 800 to 14,000 square feet of freezer storage space by rearranging and adding Armorply modules

Easy, fast, low-cost expansion—this is Armorply wall module's big appeal to Sylvan Seal, fast-growing division of the Borden Company.

Sectional walls of Weldwood® Armorply® metal-clad plywood as prefabricated by the Freezer Box Division of Annapolis Yacht Yard, Annapolis, Md., have a patented, joint-locking device which makes for easy joining and eliminates sealing problems. And, Armorply rooms for normal temperature operation (+ 30°F to + 35°F) need no complex foundations or costly masonry—just erect them on a concrete slab. For low-temperature operation, modular floor sections on a concrete slab may be used. An Armorply wall-module room is easy to move—as Sylvan Seal discovered when they moved their 20 x 96 Armorply freezer room (step 3 above).

More usable freezer storage space with Armorply modules. The walls are thinner, the floor space larger than ordinary cinderblock-plus-insulation allows. Yet the superb insulating properties of Armorply wall modules let you maintain constant temperatures as low as −100°F, making it easy to comply with new sub-zero storage standards. **No painting, easy maintenance.** Armorply wall modules come faced with aluminum, stainless steel, or zincbond steel; each is resistant to water, dirt, and vermin.

WELDWOOD ARMORPLY

Modular Refrigerated Structures

—SEND FOR FREE ARMORPLY SAMPLE—

Engineered Products Department
United States Plywood FE 12-60
55 West 44th Street, New York 36, N.Y.

☐ Please send me a sample of Armorply and the descriptive booklet #2133 on Armorply cooler and freezer rooms.

☐ Please have a Weldwood representative call with full details.

Name.....

Firm.....

Address.....

City.....Zone...State.....

KELCO COMPANY

REFINED ALGIN PRODUCTS

technical bulletin

Use unique Kelco Algin Colloids to improve your food products

SALAD AND DESSERT GELS made with KELCO-GEL HV have superb body and excellent texture. They will not melt, soften or show leakage at room temperatures. Mold release is fast and clean, without heat.

DIETETIC PUDDINGS made with KELCO-GEL LV have firm velvety body for added taste and eye appeal. Palatability of low sugar formulations is greatly improved by the gelling action of KELCO-GEL LV.

PACKAGED DRY MIX DESSERTS made with KELCO-GEL HV and KELCO-GEL LV absorb cold water rapidly to produce uniform, tender-textured puddings, gels and fillings that are extra light and effectively stabilized.

No More Effective Way To Produce Clear, Sparkling Food Gels

Tailor made to produce clear sparkling gels, the KELCO-GELS are sodium salts of alginic acid that are highly soluble in water.

KELCO-GEL HV is recommended for use where considerable added viscosity is required with a minimum amount of stabilizing action.

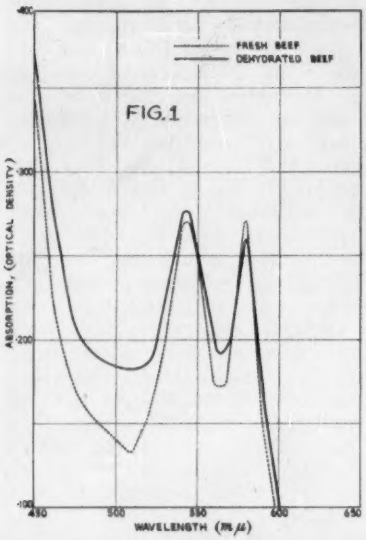
KELCO-GEL LV is recommended for use where a high degree of stability is desired along with a minimum change in viscosity and body properties.

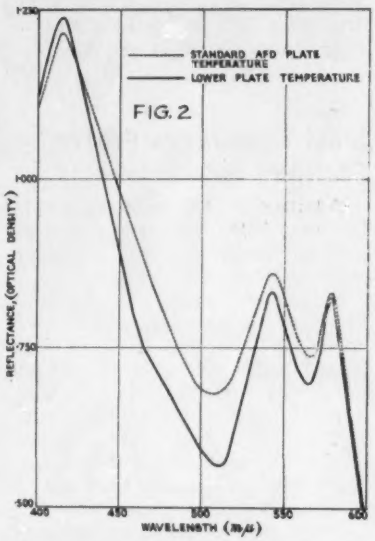
Yours On Request: Free samples of KELCO-GEL HV and KELCO-GEL LV and new Technical Bulletins describing these unique Kelco algin products. At your service, too, are highly qualified food technicians ready to give individual attention.

KELCO-GEL HV® KELCO-GEL LV® *products of* **Kelco Company**

75 Terminal Avenue, Clark, New Jersey • 20 N. Wacker Drive, Chicago 6, Illinois • 530 W. Sixth Street, Los Angeles 14, Calif.

Cable Address: KELCOALGIN — CLARKNEWJERSEY





METMYOGLOBIN CONTENT as determined in two tests: Fig. 1—Absorption spectra show quantity of metmyoglobin (absorp. max. 505 mμ) is greater in dehydrated meat; Fig. 2—Reflectance spectra indicate a much lower metmyoglobin content at lower dehydration temperature.

Metmyoglobin Formation in Beef May Be Key to Color in Freeze-Dried Meats

The color of dehydrated raw meat, linked in the consumer's mind with freshness, is paramount in consumer acceptance. Meat dehydrated by accelerated freeze drying normally has a pink-puff color which changes after reconstitution to a red-brown color somewhat duller and less attractive than that of fresh meat. Before any improvements in color can be made, an understanding is necessary of the chemical changes which occur in the meat pigments during processing.

In this study pigments of dehydrated raw meat were examined spectrophotometrically by absorption measurements on aqueous extracts, and by reflectance on dried material. Reflectance measurements showed that oxymyoglobin was present in dehydrated meat.

The proportions of metmyoglobin, oxymyoglobin and myoglobin found in aqueous extracts of dehydrated beef were: 30.7%, 69.3%, and 0%, respectively; in fresh beef the proportions were: 5.2%, 91.8%, and 3%, respectively. Dehydration, therefore, brought about an increase in metmyoglobin which was responsible for the browner color of dehydrated meat.

Two other factors were studied with these results: Treating the surface of meat with ascorbic acid prior to dehydration was found to increase the metmyoglobin; and, the metmyoglobin content of dehydrated beef can be lowered to half and color thereby improved by dehydration at lower temperatures.

The findings described here may also be applied to similar problems. Such knowledge may also be helpful in studying changes in meat brought about by modifications in the freeze-drying process. For instance, dehydrated smoked bacon is paler in color after reconstitution than is fresh bacon. This may well be due to a change in the nitrosomyoglobin similar to that found in the oxymyoglobin of beef. —*Food Processing & Packaging (Br.)*, 363-366, Oct., 1960.

Loading Pattern Cools Citrus Fruit in Transit

A new pattern for loading trucks with 4/5-bushel fiberboard boxes of citrus fruit cools the load much better than the usual pattern.

Although air channels are provided throughout the load to move cooling air to all the containers, there is no reduction in the truck's load capacity compared with the usual solid load. The new pattern also adds to the load's stability, helping to avoid damage of containers in transit.

By selecting one of four alternate methods of building the first stack of boxes next to the bunker, the trucker can use the new pattern in a truck of any length. The usual troublesome crosswise stack at the front or back of the load is eliminated.

Test shipments under ventilation with outside air, using the new pattern, arrived at their destination about 10 deg. cooler than companion solid loads. With heavy icing, loads with the new pattern were reduced 10 deg. further.—*Agricultural Marketing Service* (USDA), Sept., 1960.

'Autolysis' Improves Tenderness of Beef

Improvement in tenderness of beef during first few weeks of cold storage is often attributed to "autolysis" of the cathepsins of muscle tissue. The increase in the non-protein - nitrogen (NPN) that should occur during such autolysis has not always been found, though increases in free amino acids have been reported.

In careful experiments on *longissimus dorsi* and *psoas* muscles from prime beef animals, taken within an hour after slaughter, a small but definite increase in NPN and free amino acids could be demonstrated. Storage for 16 hours at 37C. (98.6F.) gave a 13% increase in free amino acids. Bacterial development increased the liberation of free acids thereafter. Glutamic acid predominated, suggesting a non-protein source.

The extremely small protein degradation observed seems an unlikely cause of tenderizing, and the changes in beef-texture during conditioning storage must be sought elsewhere. Changes in water-bind-

USE JEFFERSON U.S.P. PROPYLENE GLYCOL

Most Versatile Polyol for Use in Foods, Flavors and Extracts

U.S.P. grade propylene glycol has low toxicity and excellent solvent, hygroscopic and preservative properties which make it preferred in a great variety of food processes. Food flavor, color or emulsion solvent; flavor extractor; humectant in packaged food products . . . these are a few of the proved applications for U.S.P. propylene glycol.

For helpful technical service or prompt delivery-price information, write to Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

JEFFERSON CHEMICALS

Houston • New York • Chicago • Cleveland
Charlotte • Los Angeles

ing capacity of proteins, breakdown of adenine nucleotides to hypoxanthine, breakdown of connective tissue, and changes in the polysaccharide fraction of the meat are some of the possibilities.—*Jour. Science of Food and Agriculture*, 520-526, Sept., 1960.

Most Consumers Prefer Fortified Milk Drinks

Addition of 1% milk-solids-not-fat to whole, low-fat, or nonfat milk beverages improves consumer acceptance of each type drink.

This was demonstrated by consumer and taste panel studies conducted at U. of Arizona. Used were pasteurized, homogenized whole, low (2%) fat and skim milk prepared from the University's supply. Similar samples were prepared by fortifying above milks with 0.5-2% good-flavored, low-heat nonfat milk powder.

There was slight but significant preference among consumers for a fortified low-fat drink compared with nonfortified whole milk. But no significant difference was noted between a non-fortified low-fat milk and a fortified nonfat product.

A slight but significantly greater preference was shown for a regular fortified whole milk (3.5% fat) than for a non-fortified 4% fat whole milk.—*J. Dairy Science*, 945-50, July, 1960.

Changes in Cheddar Cheese During Curing

From plants in N. Y., Wisc., Ore., and Ohio, 14 lots of Cheddar Cheese were obtained and cured for 2 mo. at 50 F., followed by curing at 40 F. for 10 mo. Periodic analyses were: Grading, evaluation for flavor, ammonia, H_2S, free fatty acids, acidic and neutral carbonyl compounds, pH, and total bacterial count.

Generally, ammonia, free amino acids, and free fatty acids increased during curing, while H_2S and bacteria counts fluctuated. Raw milk cheese contained higher concentrations of H_2S than pasteurized milk cheese, with no conclusive differences apparent in ammonia, free amino acids, and free fatty acids.

The flavor of the Cheddar Cheese appeared to be related more to the ratio of free fatty acids and H_2S concentrations than to any other compounds or combinations thereof.—*Jour. of Dairy Science*, 1202-1215, Sept., 1960.

Antibiotic, Irradiation Effect on Potatoes

Prepeeled potatoes deteriorate rapidly during non-refrigerated transportation and storage, and may have a shelf life of less than 24 hours. To determine the effect of antibiotics and gamma irradiation on prepeeled, sulfite-treated potatoes at room temperature, Sebago and Katahdin potatoes were peeled, trimmed, and sliced into French fries ⅜-in. square in cross-section.

The dipping solutions used included sodium metabisulfite, oxytetracycline, and nisin. After dipping and draining for 30 seconds, the potatoes were packaged in Cryovac or polyethylene bags and sealed. The sealed bags were irradiated with gamma rays from cobalt-60 at the rate of 200,000 rads/hr. Doses of 100,000 to 300,000 rads were used and the potatoes were stored for periods up to 8 days.

Bacterial development occurred in all samples except those treated with oxytetracycline, but color changes and storage "off-flavor" development makes the treatment unsatisfactory for commercial use.—*Applied Microbiology*, 311-314, May, 1960.

Bone-Taint in Meat Has Bacterial Origin

Bone-taint, a deep-seated spoilage of meat, has been shown to have a bacterial origin. The term is not rigidly defined and it has been applied to any type of off odor that originates in the deeper tissues, especially around the hip joint. The taint may be sweet, sour, putrid, or sewer-like. Bacteria from the ischiatic lymph node, excised from carcasses within about 30 minutes after slaughter were found to represent at least eight genera, but an unidentified *Clostridium* species predominated in 81 per cent of the nodes from tainted beef.

However, other bacteria isolated from the tainted samples would also be capable of causing taint. The number of bacteria found in the ischiatic lymph nodes is less after periods of high rainfall in the cattle-grazing areas. Prompt chilling of carcasses after slaughter is the best preventive measure for beef taint, since other factors influencing the incidence of the spoilage bacteria are not amenable to control at the present time.—*Jour. Science of Food and Agriculture*, 436-441, Aug., 1960.

LOADED WITH NEWS—this Mack B-61T Model easily maintains top legal speeds, faithfully delivers its cargo of daily newspapers throughout a large Midwest area. Its Thermodyne diesel dependability rolls up 5,000 trouble-free miles every month. Other Mack tractors and platform trucks speed newspapers and magazines to metropolitan Chicago news dealers.

PERISHABLE—handle with Macks!

Nothing's as stale as yesterday's news. That's why "high-ball" delivery of daily newspapers is a must . . . and why the Chas. Levy Circulating Company of Chicago, the Midwest's largest newspaper and magazine distributor, is switching to Macks. Macks give the top legal speeds needed for fast runs and the everyday dependability essential to this five-state operation.

No matter what the weather—and it varies from 25° below to 105° above—or the traffic conditions, the company's Macks operate faultlessly with no appreciable downtime. This means that news dealers and distributors in five states as well as in Chicago's outlying suburbs are assured of dependable, regular, on-time delivery.

For the same reasons you'll find more and more haulers of "perishable" commodities joining the trend to Mack trucks. Many are specifying the added advantages of Mack-built, world-famous Thermodyne® diesel power, too—among them, lowest fuel and maintenance costs . . . complete reliability . . . and long, trouble-free operating life.

Whatever you haul, wherever you haul—your Mack branch or distributor has the exact Mack truck or tractor, diesel or gasoline-powered, to deliver your cargoes safely and quickly. Have your Mack representative supply you with the names of other successful Mack operators, and stack their operating gains against your own. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

7876

MACK
FIRST NAME FOR
TRUCKS

MACK for over 7 straight years NO.1 by far in sales of diesel trucks

CIRCLE 79 ON READER SERVICE CARD

CONVEYOR CHAIN BELT carries cases down platform and into milkhouse for distribution at . . .

SPECIFIC DOORS for specific orders. Under preload system, driver simply backs his truck up to the . . .

LOADING DOCK in front of his assigned door, one of 11 which line each side of the milkbox. Load is easily hook-pulled into rear of truck.

Dock-Conveyor System Preloads Trucks Fast

Orders are ready and waiting for retail delivery trucks at new distribution branch of Abbotts Dairies. Preload method utilizes conveyor and rigid time schedule

CALIFORNIA-STYLE retail truck-loading is paying off in time and labor savings, plus a big boost in efficiency, at the Trevose plant of Abbotts Dairies in Northeast Philadelphia.

Completed early this year, this modern distribution plant's office, yard, and refrigerated milkbox is aimed at top efficiency, speed, and control.

Under a preload system, 18 truck-loads may be prepared and ready to go at one time. Moreover, 55 routes are fully loaded in 15 min., a saving of more than 2 hr. over the previous method used at Abbotts' plants.

Design of the milkbox is most important. It consists of a rectangular cinder-block building 100-ft. long and 25-ft. wide, a platform 60x34-ft., and a trailer dock measuring 25x7-ft.

A conveyor chain belt (Mojonnier) runs from the dock, down the platform, and through the length of the milkbox. On each side of the box are 11 doors which open onto a cement platform 4-in. wide and about 3-ft. high. Each door can accommodate 4 trucks.

Handling the complete preload operation are just 5 men over a 24-hr. period, fewer men than formerly would be required. And here's how it's done:

Disciplined Schedule

At 12 noon, one of Abbotts huge trailer trucks arrives at the Trevose plant from the Norristown processing plant with a load of Homo D quarts. Two men begin work unloading. One is employed on the trailer dock pulling stacks of cases and placing each on the conveyor. Stacks are carried along dock, over the platform, and through a door into the milkbox. Cases continue on conveyor until pulled aside by inside worker. Each door is designated for a certain route order, with the day's delivery needs posted nearby. Needed quarts are placed next to and in front of the door.

At 3 p.m., a second trailer arrives with a variety of milk and dairy products from the main Philadelphia plant of Abbotts. A second man also arrives to assist in filling orders in the milkbox. By 6 p.m., the second trailer is unloaded and quarts are properly door-positioned.

A third trailer arrives at 6:30

JACK L. MISCHOU
Assistant Editor, "Food Engineering"

p.m. This is the "finish-up" trailer bringing in the balance of items needed to fill out orders. Two men are joined by a third man who works until midnight filling special orders for about one-half the routes. Specials consist of juice, butter, cheese, etc.

At midnight, the 3 o'clock man goes home and the crew's fourth member checks in. He fills the balance of specials and is the only in-plant man needed on the job when the 55 route trucks load up in the morning. Drivers simply back up to assigned doors and hook-pull their complete order into the rear of the truck—loads are ready-made.

Crew's fifth man, the foreman, arrives anywhere from 9 to 11 a.m. and oversees the day's performance. He is responsible for organizing the order operation and is also on hand for any problems that might arise. A sixth man is used as a relief, filling in for each of the crew members on days off, but the daily crew still numbers only five.

Crew is also responsible for loading the previous morning's empties back onto trailers after each unloading operation. Conveyor is simply reversed to carry empty cases off the platform to the dock, ready for loading into trailers.

The whole operation, preloading orders and loading empties, is handled with a minimum of physical labor, in double-quick time, with less actual man-hours.

Plan Two More

The milkhouse maintains a constant temperature of 35 deg., using two compressors. Construction cost of the entire branch plant, including the office and maintenance buildings, was about $200,000.

According to Ernest Barber, sales manager of the Trevose plant, the system is working out in excellent fashion. Problems in lost time and mixed-up orders are almost negligible.

And Walter Ricketts, Abbotts' chief engineer, has this to say about the system, which originated in the West but which is becoming more and more common throughout the country: "We're extremely happy with the dock-loading method and the new plant in general. We are presently putting the finishing touches on a distribution center in Norristown that incorporates only slight modifications over the design of the Northeast plant. Same is true of another branch now being constructed near Camden, N. J." (End)

YOUR CHICKEN DINNER AND FRICK REFRIGERATION

• From the farm to your fork, the chicken that's served to your family has been kept fresh by refrigeration.

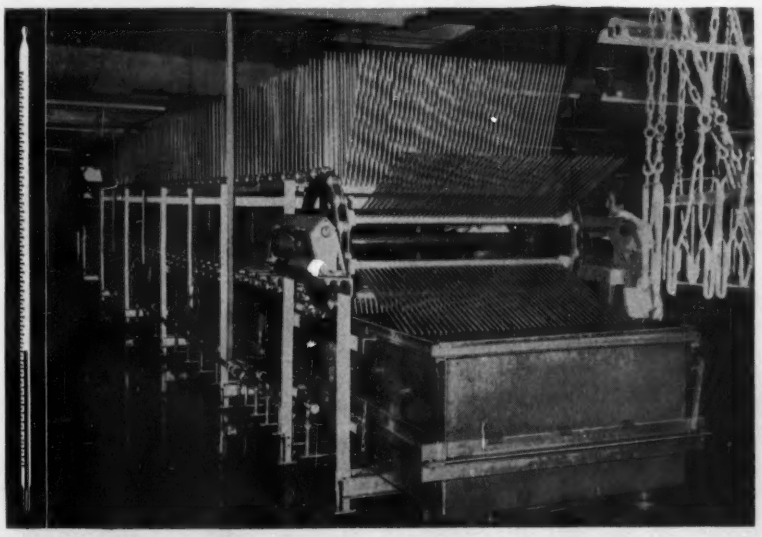
The Frick Company, pioneers in refrigeration, has developed an economical process that is years ahead of other methods of chilling freshly killed birds. Using a continuous flow of cold water instead of costly ice, the Frick system cools the birds to 36 or 37 degrees—not just the minimum requirement of 40—thereby preserving freshness and locking in flavor.

Frick's ability to design and install quality refrigeration for processing, packaging and storing foods of *all* types is recognized by engineers throughout the world.

No matter what *your* refrigeration or air conditioning problem is . . . for beans or beer, poultry or peaches, pharmaceuticals or farm-fresh apples . . . Frick offers depend*ability*.

If your business requires refrigeration or air conditioning in *any* phase of its operation, a Frick engineer will be happy to discuss it with you at no obligation.

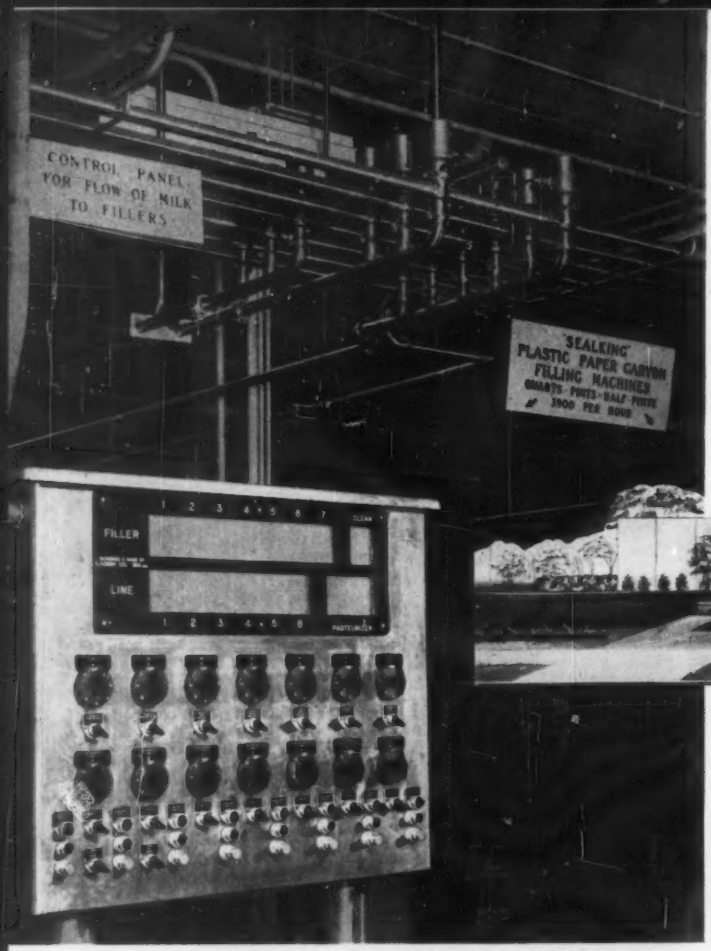
FRICK COMPANY, Waynesboro, Pennsylvania

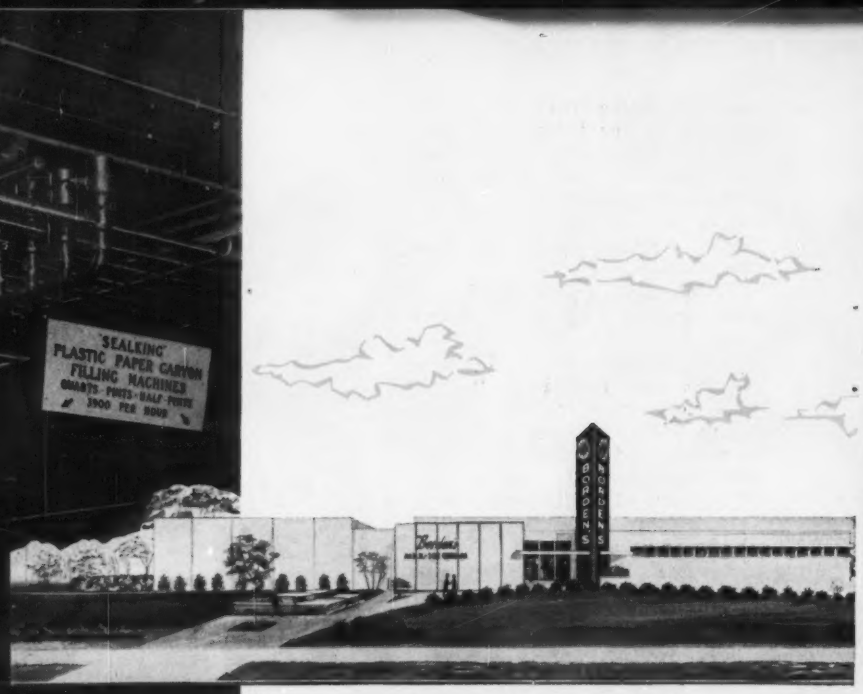


• Here's a Frick Counter-Flow-Continuous ("C-F-C") Poultry Chiller, one of four in operation at Holly Farms Poultry Processing Plant, Wilkesboro, North Carolina.

The continuous flow of water passes through only once, with no recirculation, and the chiller operates continuously instead of in batches.

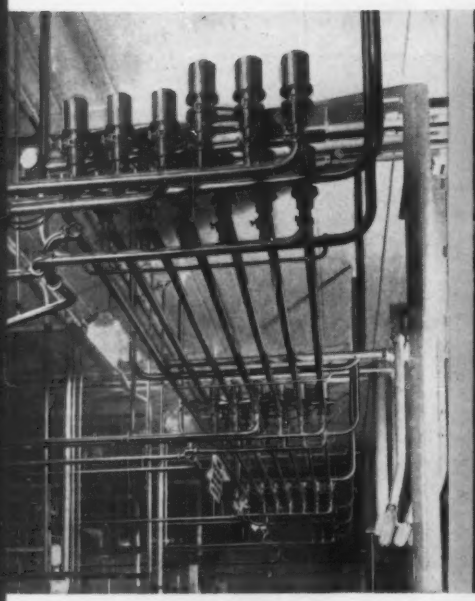
Savings up to ¼c per pound are realized by using the Frick "C-F-C" chiller when compared to the use of ice. Figure the money saved at Holly Farms, which processes 9,600 birds an hour, using Frick refrigeration equipment exclusively.



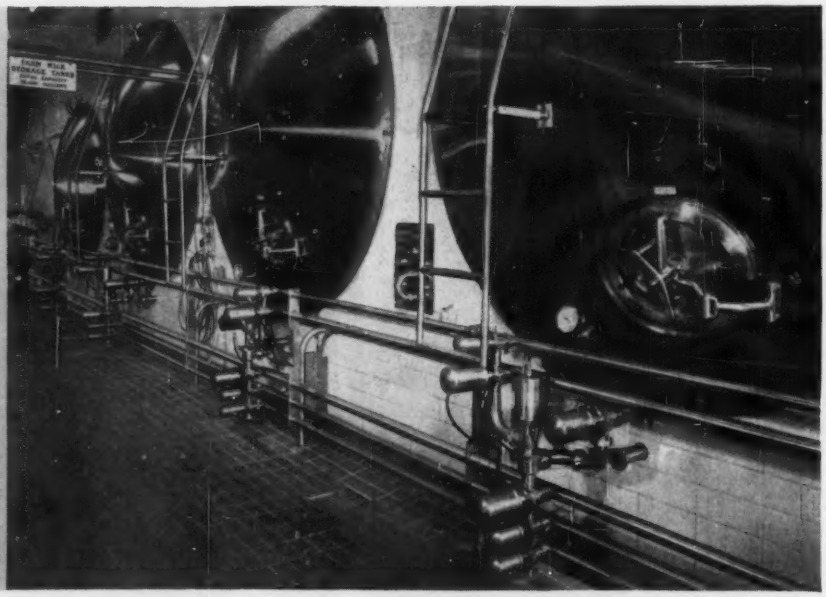


The control center at left automatically controls the flow of milk to fillers. Panel has a projection type digital display unit which shows at a glance exact status of filling operation.

The control panels, air-actuated valves, and valve manifolds are products of Ladish Co. Fesco Division, specialists in the design of automatic control systems . . . and in the installation of air-actuated valves and controls used in these systems.



"Fesco" air-actuated valves are the "heart" of the automatic processing operations. There are 152 of these efficient automatic valves installed in this plant for accurate control of liquid flow.



View showing a group of stainless steel farm milk storage tanks, having a combined capacity of 70,000 gallons. Filling operations, distribution of milk to pasteurizer, and CIP cleaning operations are controlled through seven "Fesco" valves connected to each of these tanks.

TRI-CLOVER EQUIPMENT

helps Borden's "Dream Plant" achieve new standards in Automatic Processing

INSTALLATION "HIGHLIGHTS"

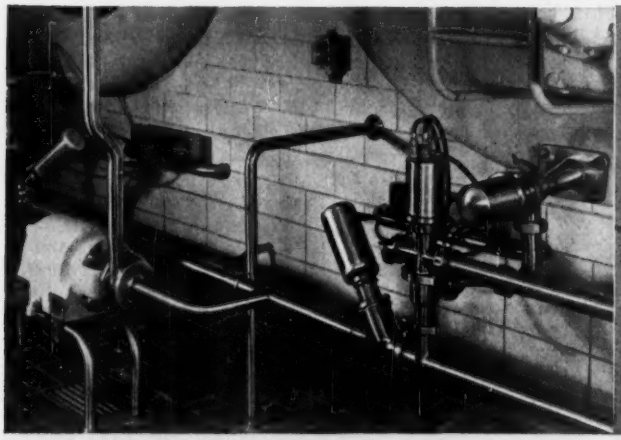
- 110,000 square feet of floor space
- Raw milk storage capacity, 70,000 gallons
- Can pasteurize, homogenize and cool 35,000 quarts per hour
- Capacity to process a half-million quarts of milk per day
- Control system utilizes over 30,000 feet of electrical wire
- Process lines inter-connected by almost 7,000 feet of stainless steel tubing
- Automatic flow control handled through 152 air-actuated valves

Wisconsin's largest, most modern milk and ice cream plant . . . Borden's *"Dairyland Showcase"* . . . is now in operation. With its processing capacity of 500,000 quarts of milk per day, this amazing plant could supply a pint of milk daily to every family in Wisconsin. It will be able also to produce five million gallons of famous Borden's ice cream per year.

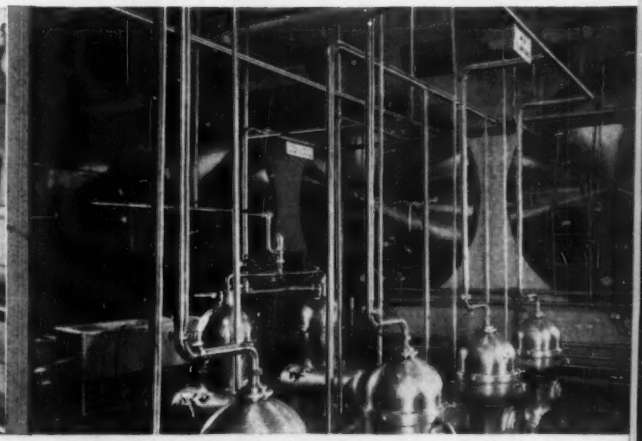
Ladish Co. is proud of the important part played by its Tri-Clover and Fesco Divisions in helping The Borden Co. achieve new standards of efficiency in the modern, automatic processing operations of this Wisconsin "Dream Plant".

The equipment, some of which is illustrated on these pages, was designed, manufactured and installed by Ladish Co. Tri-Clover and Fesco Divisions and includes 152 *"FESCO"* air-actuated valves . . . several modern, practical control panels . . . hundreds of "Tri-Weld" stainless steel welding fittings, welded in place with a "Tri-Welder" automatic welding machine right in the plant . . . numerous Tri-Clover sanitary centrifugal pumps . . . special pipe hangers and supports . . . as well as almost 7,000 feet of stainless steel tubing "Tri-Welded" on the job.

This "Showcase" Plant serves as a most striking example of the way in which the combined engineering ability, design and manufacturing skill of these Ladish Co. Divisions has helped to lead the way to modern automated dairy plant operation. Let this wealth of experience serve you in your next expansion program.



Valve manifold used for filling pasteurizer storage tanks and for transferring milk from these tanks to the filling machines. Also, note the simple, clean and effective method of mounting one of the many Tri-Clover pumps to permit fast, easy removal of the unit from the lines for inspection and maintenance.



"Tri-Weld" stainless steel butt weld fittings are employed extensively throughout this efficient Borden "Showcase" installation. The "Tri-Weld" lines installed above these clarifiers and separators were quickly and economically fabricated right on the job with Tri-Clover's new portable welding machine . . . The "Tri-Welder".

See your nearest Tri-Clover Distributor.

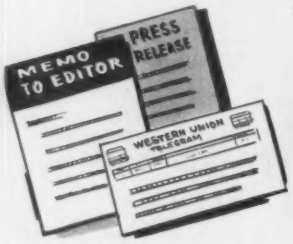
IN CANADA: Brantford, Ontario
EXPORT DEPT.: 8 South Michigan Ave., Chicago 3, U.S.A.

TRI-CLOVER

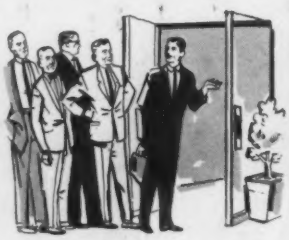
LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

45-500

Ways to Make Public Relations Pay Off



News releases



Plant tours

Speeches by company reps

Meetings with opinion-molders

Get the Consumer on

Goodwill is a priceless asset when it draws customers to your product. Here are practical tips on building an effective public relations program that will smooth your selling job

GOOD IDEAS for effective product promotions don't originate in one location alone. Which is why many food companies today are looking both ways—toward advertising and public relations—in an effort to strengthen their merchandising campaigns.

In today's highly competitive food market, slim profit margins make promotional efforts doubly important. Because of this, you should carefully examine the special advantages of integrating public relations with your overall marketing program.

Budget-conscious food companies are increasingly aware that the twin prongs of an advertising-public relations effort — for the same, or a slightly increased, cost—are better than the single effort of an ad campaign.

Although the benefits of a professionally executed PR program are many, let's explore just a few of particular interest to food manufacturers.

Of primary importance is the use of consumer publicity in newspapers, magazines, radio, and television. Such publicity carries with it an implied third-person endorsement by those media.

Readers, accustomed to many years of advertising exposure, realize that when a company purchases advertising space to comment about its products, it is clearly the case of someone talking about himself. When an editorial story about the same product appears, it is the newspaper or magazine talking about the product—an important difference. The "grain of salt" with which many readers take advertising is not present when they read editorial matter.

Along with consumer publicity, trade publicity plays an important part in any public relations program. Facts about new products and policies, technical articles, features on a company's growth —all these help to further familiarize distributors with the company, and help to create in the minds of customers an image of progressive management.

Stretching The Ad Budget

In both cases, it is possible to extend advertising dollars. For example, a merchandising campaign is given greater exposure when publicity is used as a supplementary tool to provide news coverage for such efforts. When a client of ours plans a contest, a particular sales drive, or similar special "push," we work closely with the ad agency to see that news of these promotions is circulated to all pertinent consumer or trade media.

While publicity is often considered the "glamorous" part of a PR program, a major mistake made by many companies using public relations, lies in considering it to be the whole program.

The fact is that while publicity is most important, publicity articles, unless they are properly used, have little value. Like yesterday's newspaper, they are quickly forgotten.

In this area it is imperative that a merchandising program be used to get the most out of publicity space. Usually, the amount of money spent for such a program is only a fraction of the money invested in getting publicity in the first place — but its value is at least equal.

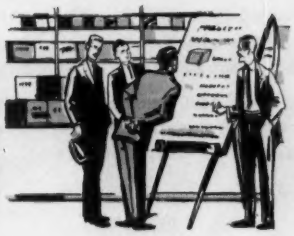
For example, we have represented the Visking Co., Division of Union Carbide Corp., for the past eight years. Visking, manufacturer of sausage casings, engages in a comprehensive consumer education campaign in behalf of meat packers. This takes the form of an advertising campaign and a heavy publicity effort via newspaper and magazine food editors, to extend the use of sausage.

Although the success of the campaign has been great—it has won a professional award—an almost equal amount of effort goes into a merchandising campaign for the company's customers and dealers.

Every news release that is prepared for the press is also issued to the company's salesmen. Periodically, detailed reports in the form of publicity reprints are sent to Visking's meat packer customers. Along this line, the company has just finished reproducing the entire 1959-60 scrapbook of pub-

LEE SCHOOLER
President, Public Relations Board Inc., Chicago

Special publications



Industrial exhibits

Personal contact

Your Sales Team

licity clippings—some 148 king-size pages—for distribution to its customers.

Such a program goes a long way in keeping Visking's activities in front of customers and in keeping the morale of the sales force at a high level. Such efforts breed other efforts on the part of salesmen. They can do a far better selling job when they know they represent a company whose products are respected by the opinion-molding force that is the nation's press.

To maintain this morale, a special place is made each year at the company's annual sales meeting for a discussion and report on the public relations program. In this way, the sales force is always kept up to date and is able to use public relations as a talking point with customers.

Another area often neglected by manufacturers is that of industry participation. In the food field, a number of trade associations sponsor annual promotions which offer valuable methods of working out dealer promotions and timely product publicity.

Tooling Up for Objectives

Since much of the basic research and promotional materials are prepared by the associations, this can be an economical, effective way of increasing the value of the PR dollar. Such promotions include "Better Breakfast Month," "Picnic Month," "National Sandwich Month," to name a few. While it is true that sometimes there is an over-emphasis on such promotions to the exclusion of year-around activity, they often have an important place.

However, PR's potential is only as great as the priority given to it by the food manufacturer—with corresponding arrangements made for people to do the job.

This leads to staffing properly for public relations, and the choice between an internal department or outside counsel. While the former has certain advantages, companies should study the wisdom of an internal department carefully if an effective program is really desired.

In a limited program, for example, a man brought in to do the job is only as experienced as the budget allows. Too, he will, in many cases, become involved in other company matters—usually quite apart from his main purpose, public relations — and the company finds that while it is paying for a full-time man to carry out a PR program, his time spent on that function is only a fraction of what it should be.

Many public relations firms can do a more effective and less costly job because they are devoting all the time for which they are being paid to the task for which they were hired in the first place. And with many firms offering a choice of a monthly retainer or an hourly fee, a program that is practicable and a budget that is realistic can be set.

A final point: If you are inclined to underrate the impact of editorial copy appearing about your company as a result of a public relations program, consider this. You have now read a complete article about public relations; if we had placed an ad extolling its virtues, you would have already skimmed it — and possibly forgotten it. (End)

in dry mixes; breads and rolls; sweet goods and coffee cakes; biscuits, muffins; waffles and pancakes, etc.

NOW AVAILABLE . .
A NATURAL INSTANT FERMENTATION FLAVOR . .

that imparts true yeast-leavened flavor and aroma in chemically leavened baked goods without time consuming dough fermentation.

VICO 400, a unique NATURAL flavoring captures the full spectrum of flavor notes characteristic of natural yeast fermentation.

VICO 400 initiates a new concept of flavor production. It brings out — INSTANTLY — a true yeast leavened flavor in various baked products, thereby intensifying and improving their taste appeal. It is especially effective with the blander types of chemical leavening agents.

VICO 400 is a dry, highly stable flavoring in powder form, easy to handle and ready for use at any time.

To form your own impartial judgment, send for a sample and information on how to use VICO 400 to best advantage in your formulas. A thoughtful comparison of flavors will demonstrate an unmistakable new taste experience in VICO 400 products.

Manufacturing Chemists to the Food and Pharmaceutical Industries.

VICO
PRODUCTS
COMPANY

415 West Scott Street, Chicago 10, Ill.

The Importance of Logic in Packaging Machine Design.

The most successful packaging machine is the most simple in concept. Unnecessary complexity invariably taxes itself in speed, performance, efficiency and maintenance.

Triangle originally entered the bag making, filling and sealing field to develop a single tube machine. No other consideration was allowed to complicate the basic requirements. That's why Triangle's single tube machine has been so unusually successful.

What could be a more logical starting place for developing a multi-tube bag maker, filler and sealer . . . ?

NOW TRIANGLE MORE THAN DOUBLES THE ADVANTAGE OF ITS REMARKABLE BAG MAKER, FILLER AND SEALER!

Regardless of whose equipment you're using or whether you're presently considering equipment purchase, you owe it to yourself to investigate the new Triangle Twin machine. The reason? It has all of the advantages, all of the flexibility, all of the efficiency our single tube equipment has without any of the disadvantages common to all other dual tube machines.

Briefly, Here's Why . . .

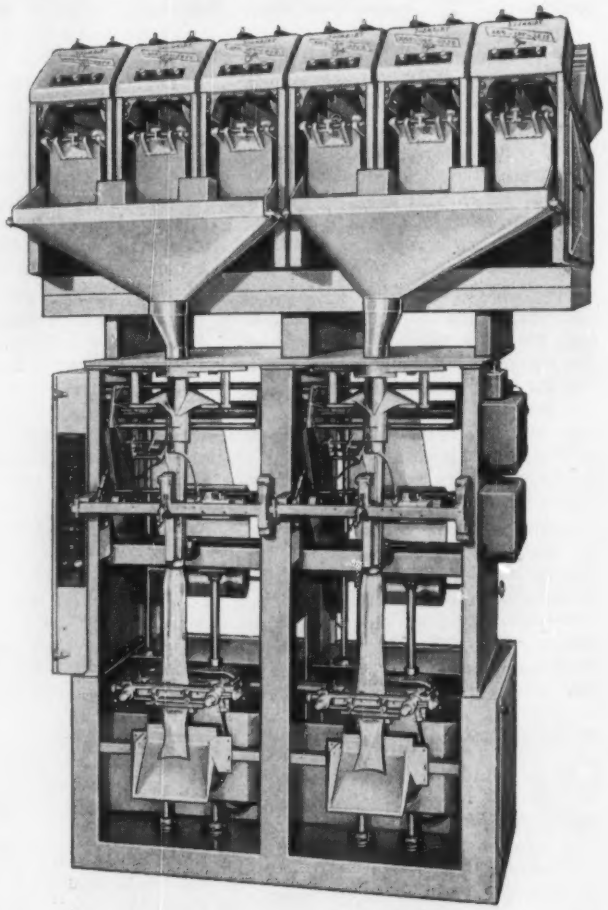
The Triangle Twin is fast . . . 120 bags per minute with any bag material (90 per minute with polyethylene). It will handle a full range of bag sizes up to 8" x 16", (also available 11" x 12½").

The Triangle Twin is a fully integrated combination of two, efficient single tube machines with one common drive . . . yet sealing jaws operate independently to permit one side to operate while the other side is down for film threading or routine maintenance. This feature results in *less* downtime and more production than normally expected.

The Triangle Twin mounts up to *six* Elec-Tri-Pak net weighing scales on top where they belong. No costly intermediate elevator feed is required. Volumetric filler and other synchronized systems are also available.

The Triangle Twin has all the performance of the time proven single tube bag maker and filler . . . fast, simple changeover for all materials from cellophane to polyethylene . . . quick return jaw assembly . . . simple, functional design of sealing jaws. . .

See for yourself how far the Triangle Twin has advanced the concept of high speed bag making, filling and sealing. Write today—without obligation, of course.



. . . . . YOU REALLY SINCE 1923 SAVE WITH . . . . . .

F-7L22

TRIANGLE PACKAGE MACHINERY COMPANY

6637 West Diversey Avenue, Chicago 35, Illinois • Telephone: TUxedo 9-0200

'Directs' and 'Indirects' Listed

Rulings also made on migrating substances from rubber and rubber products used in food handling

RECENT EXTENSIONS have been granted by the FDA until Mar. 6, 1961, for more substances as 'direct' and 'indirect' additives. Uses or restrictions have been specified for these items. In addition, extensions as 'indirects' have been granted to substances migrating from rubber and rubber products used in food handling.

Earlier listings on additives rulings have appeared as follows: Jan., p. 81; Feb., p. 19; Mar., p. 89; Apr., 99; May, p. 77; June, p. 85; July, p. 85; Aug., p. 75; Sep., p. 117; Oct., p. 115; and Nov., p. 105.

FDA Extends Dates for Specified Additives

DIRECT ADDITIVES	LIMITS	SPECIFIED USES OR RESTRICTIONS
Butylated hydroxyanisole	0.1 percent	As an antioxidant in chewing gum base.
Chilte (chilte paloia)		As a constituent of chewing gum base.
Hydrocarbon oil (deodorized), kerosene aliphatic type	30 p.p.m. in filtrate	As a defoaming agent used in manufacture of glutamic acid from beet sugar process.
Soybean and cottonseed fatty acids (palmitic, stearic, oleic, linoleic, linolenic, myristic).		

The following items have been listed as **indirect** additives without specified limits:

INDIRECT ADDITIVES	LIMITS	SPECIFIED USES OR RESTRICTIONS
Ethylene glycol monobutylether		As a constituent of paper mill felt cleaner.
Ethylene oxide condensation product (9 mols) and nonyl phenol (1 mol).		
Pine oil		As a constituent of paper coating used in food packaging.
Polyethylene glycol 600 dioleate		As a defoaming agent used in manufacture of paper and paperboard for food packaging.
Polyethylene glycol 4000 distearate		
Polyethylene glycol 1000 monostearate		
Polyoxyethylated nonyl phenol (6 mols ethylene oxide, 1 mol nonyl phenol).		
Polypropylene glycol (molecular weight 2000)		As a defoaming agent used in manufacture of paper and paperboard for food packaging.
Sodium bisulfate		As a constituent of paper mill felt cleaner.
Sodium dodecylbenzene sulfonate		As a constituent of paper and paper coating used in food packaging.
Sodium o-phenylphenate		

Migrating Substances From Rubber Products

The following additives may be used in rubber and rubber products which are used in food handling—under the condition that a minimum quantity of the additive will be incorporated in the food, consistent with good manufacturing practice:

1. Elastomers.

(a) Natural rubber.

(b) Styrene-butadiene polymer with stabilizers and/or antioxidants listed in subparagraphs (3) and (4) of this paragraph.

(c) Chloroprene polymers with stabilizers and/or antioxidants listed in subparagraphs (3) and (4) of this paragraph.

(d) Nitrile-butadiene polymers with stabilizers and/or antioxidants listed in subparagraphs (3) and (4) of this paragraph.

(e) Isobutylene-isoprene polymers with stabilizers and/or antioxidants listed in subparagraphs (3) and (4) of this paragraph.

(f) Silicone polymers with stabilizers and/or antioxidants listed in subparagraphs (3) and (4) of this paragraph.

2. Vulcanization materials.

(a) *Vulcanizing agents* — Sulfur, ground; Tellurium.

(b) *Accelerators* — 2-Benzothiazyl-*N,N*-diethylthiocarbamyl-sulfide; 2-Benzothiazyl disulfide; Benzoyl peroxide; Bismuth dimethyldithiocarbamate; *N-tert*-Butyl-2-benzothiazole-sulfenamide; Copper dimethyldithiocarbamate; *N*-Cyclohexyl-2-benzothiazole sulfenamide; Dibenzoyl-*p*-quinone dioxime; Dibenzylamine; di-*tert*-Butyl peroxide; 2,4-Dichlorobenzoyl peroxide; Dicumyl peroxide; 2,6-Dimethyl morpholine thiobenzothiazole; *N,N'*-Diorthotolyl guanidine; Diorthotolyl guanidine salt of pyrocatechol borate; Dipentamethylene-thiuram tetrasulfide; Dihenyl guanidine; 4,4'-Dithiodimorpholine; Ethylenediamine carbamate; Hexamethylene tetramine; 2-Mercaptobenzothiazole; 2-Mercaptoimidazoline; *N*-Oxidiethylene-2-benzothiazole sulfenamide; *N*-Oxidiethylene-benzothiazole-2-sulfenamide; Piperidinium pentamethylene-dithiocarbamate; Potassium pentamethylene-dithiocarbamate; *p*-Quinone dioxime; Sodium dibutyldithiocarbamate; Tellurium diethyldithiocarbamate; Tetrabutyl thiuram monosulfide; Tetraethyl thiuram disulfide; Tetramethyl thiuram disulfide; Tetramethyl thiuram monosulfide; Triethylene tetramine; Triethyl-trimethyltriamine; Triethyl-trimethylenetriamine; Trihenyl guanidine; Zinc dibutyldithiocarbamate; Zinc diethyldithiocarbamate; Zinc dimethyldithiocarbamate; Zinc-2-mercatobenzothiazole.

(c) *Retarders*—*N*-Nitroso diphenylamine; Phthalic anhydride; Salicylic acid.

(d) *Activators*—Calcium hydroxide; Dibutyl-ammonium oleate; Diethylamine; Fatty acid amines, mixed; Fatty acids; Hydrated lime; Lauric acid; Magnesium carbonate; Magnesium oxide, light and heavy; Malic acid; Sodium acetate; Soybean lecithin-*p*-triethanolamine; Stannous chloride; Stearic acid; Tall oil fatty acid; Triethanolamine; Zinc oxide; Zinc salt of fatty acids; Zinc stearate.

3. Protective agents.

(a) *Antioxidants and antiozonants*—2,5-di-*tert*-amyl hydroquinone; Butylated hydroxytoluene; 4,4'-Butylidine bis(6-*tert*-butyl-*m*-cresol); di-*tert*-Butyl-4-methylphenol; *N*-Cyclohexyl-*N'*-phenyl-phenylenediamine; *p,p'*-Diamine diphenylmethane; 1,2-Dihydro-2,2,4-trimethyl-6-phenylquinoline; 1,2-Dihydro-2,2,4-trimethylquinoline, olymerized; 4,4'-Dimethoxy diphenylamine; Dioctyl henylenediamine; Diphenyl ethylenediamine; *N,N'*-Dihenyl-*p*-phenylenediamine; *N,N'*-Disalicylal propylenediamine; 6-Dodecyl-2,2,4-trimethyl-1,2-dihydroquinoline; 6-Ethoxy-1,2-dihydro-2,2,4-trimethyl-quinoline; Hydroquinone monobenzyl ether; Isoproproxy diphenylamine; *N*-Isopropyl-*N'*-phenyl-*p*-phenylenediamine; di-*p*-Methoxy diphenylamine; 4-Methyl-6-*tert*-butylphenol; 2,2-Methylene bis(4-methyl-6-nonylphenol); 2,2-Methylene bis(4-methyl-6-*tert*-butylphenol); di-β-Naphthyl-*p*-phenylene-diamine; tri-(Nonylphenyl) phosphite; Phenyl-α-naphthylamine; Phenyl-β-naphthylamine; o- and p-Phenylphenol; Sodium pentachlorophenate; Styrenated phenol; 4,4'-Thiobis (6-*tert*-butyl-*m*-cresol); Thiobis(di-*sec*-amylphenol); 2,4-Toluenediamine; m-Toluenediamine; di-o-Tolyl ethylenediamine; N-o-Tolyl-N'-phenyl-p-phenylenediamine; p(p-Tolyl-sulfanilamide) diphenylamine.

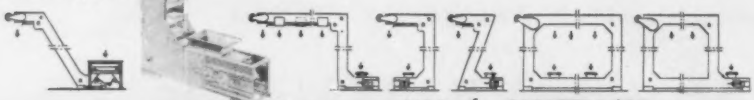
4. Plasticizers.

Amyl decyl phthalate; Beeswax; Butyl acetyl ricinoleate; Butyl laurate; Butyl oleate; Butyl stearate; Calcium stearate; Carnauba wax; Castor oil; Coconut fatty acid, distilled; Corn fatty acid, distilled; Cottonseed oil; Coumarone-indene resins; Dibenzyl adipate; Dibutoxy-ethoxy-ethyl adipate; Dibutyl phthalate; Dibutyl sebacate; Didecyl adipate; Didecyl phthalate; Diisodecyl adipate; Diisodecyl phthalate; Diisooctyl adipate; Diisooctyl sebacate; Dioctyl adipate; Dioctyl phthalate; Dioctyl sebacate; Ethylene glycol; Fatty acids, hydrogenated; Glycerin; Lanolin; Lauric acid; Mineral oil; Mineral rubber (asphaltite); Montan wax; Octyldecyl adipate; Octyldecyl phthalate; Oleic acid (red oil); Paraffin wax; Petrolatum; Petroleum oil, paraffinic; Petroleum oil, naphthenic; Petroleum oil, sulfonated; Phenol-formaldehyde resins; Pine tar; Polybutene; Propylene glycol; Rosin oil; Rosin wood and de-

MEYER *Simplex* CONVEYING ELEVATORS...

At Right, standard model with production hopper. Below, with Vibra-Flex feeder-hopper.

...are famous for their Dependability, Efficiency and Versatility. They safely and gently carry even the most delicate of products to any desired combination of horizontal, vertical or inclined distances, and are available in a size, capacity and configuration of your choice.



Write for BULLETIN 910

MEYER *Continuous Bucket, Roller Chain* ELEVATORS

Sensibly designed and sturdily built to gently and efficiently handle your product on a continuous day-in year-out basis, many Meyer Bucket Elevators are in daily operation after more than two decades of low maintenance service. Available in any required size and capacity.

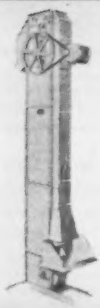
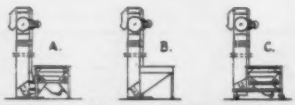


Photo at right shows Elevator with small hopper. Also available with Vibra-Flex feeder-hopper (A); with holding bins in any size or capacity (B), or as a portable unit (C).



Write for BULLETIN 912

MEYER MACHINE COMPANY
3528 FREDERICKSBURG RD.
P. O. BOX 5095
SAN ANTONIO 1, TEXAS

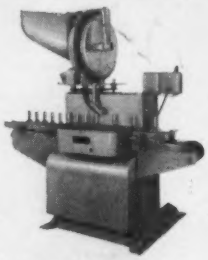
CIRCLE 87 ON READER SERVICE CARD

RESINA
fully automatic
SCREW CAPPER

The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

TOPS THEM ALL

fully automatic
FITMENT APPLICATOR



Automatically selects plastic fitments (solid or perforated) with or without lift tabs and orients them into a chute. Passing container picks up fitment which is then snapped on the container. Speeds available up to 120 per minute or higher.

Descriptive literature and specifications on request.

RESINA AUTOMATIC MACHINERY COMPANY, INC.
572 SMITH STREET • BROOKLYN 31, NEW YORK

rivatives; Soyabean fatty acids; Stearic acid; Terpene resins.

5. **Fillers.**
   (a) *Carbon black*—"Channel" process only.
   (b) *Light-colored fillers*—Aluminum hydrate; Aluminum silicate; Antimony oxide; Antimony trioxide; Barium sulfate; Calcium oxide; Calcium carbonate; Calcium silicate; Casein; Clays; Cork; Cotton (floc, fibers, fabric); Magnesium carbonate; Mica; Nylon (floc, fibers, fabric); Silica; Talc; Titanium dioxide; Wood flour; Zinc carbonate; Zinc oxide; Zinc sulfide.
6. **Colors.**
   Yellow: Cadmium sulfide, zinc chromate.
   Blue: Copper phthalocyanine, double silicate of sodium and aluminum with sodium sulfide (ultramarine blue), anthraquinone type.
   Red: Cadmium sulfide, pyrazolone (Color Index 21120), red iron oxide.
   Green: Phthalocyanine.
   White: Calcium sulfate, titanium dioxide.
7. **Lubricants.**
   Monosodium sulfates of higher alcohols.
   Polyethylenes of low molecular weights.
   Sodium stearate.
8. **Miscellaneous.**
   tert-Butyl paracetate; di-*tert*-Butyl paracresol; N-Dodecyl mercaptan; mono- and di-Heptyl diphenylamines mixture; 2-Naphthalenethiol; Polyethylene glycol (molecular weight 6,000); Styrene monomer.

Further Rulings in Brief

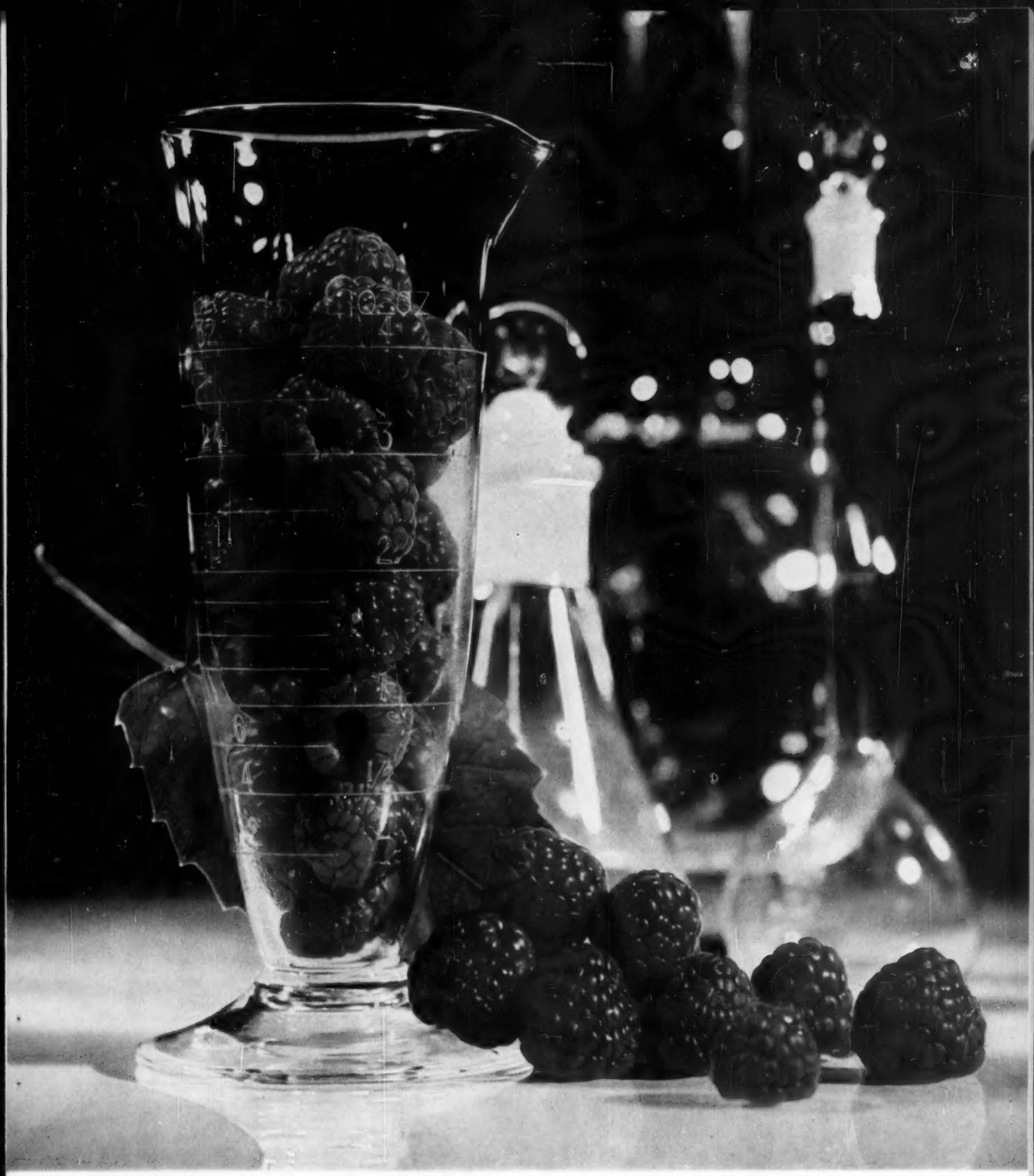
FD&C Red No. 1—Results of recent feeding tests of this color additive have demonstrated it to be toxic upon ingestion. The FDA, therefore, has terminated the provisional listing of FD&C Red No. 1 for use in foods, drugs, and cosmetics. Use of this additive in the manufacture of foods after publication date of this Order, Nov. 22, 1960, will result in adulteration.

A food additive that is a mixture of mono- and diglycerides and their lactic acid monoesters, manufactured by glycerolysis of hydrogenated lard, hydrogenated tallow, hydrogenated cottonseed oil, or hydrogenated soybean oil, and subsequent esterification with lactic acid, may be safely used as an emulsifier in or with shortening, when used in accordance with the conditions prescribed:

(a) The food additive meets the following specifications: Total lactic acid content not to exceed 16 percent; acid number not to exceed 14.

(b) It is used, or intended for use, in or with shortening whereby the total free and combined lactic acid present does not exceed 1.75 percent of the combined weight of the shortening and the food additive.

See next issue for announcement on FE Annual Editorial Index

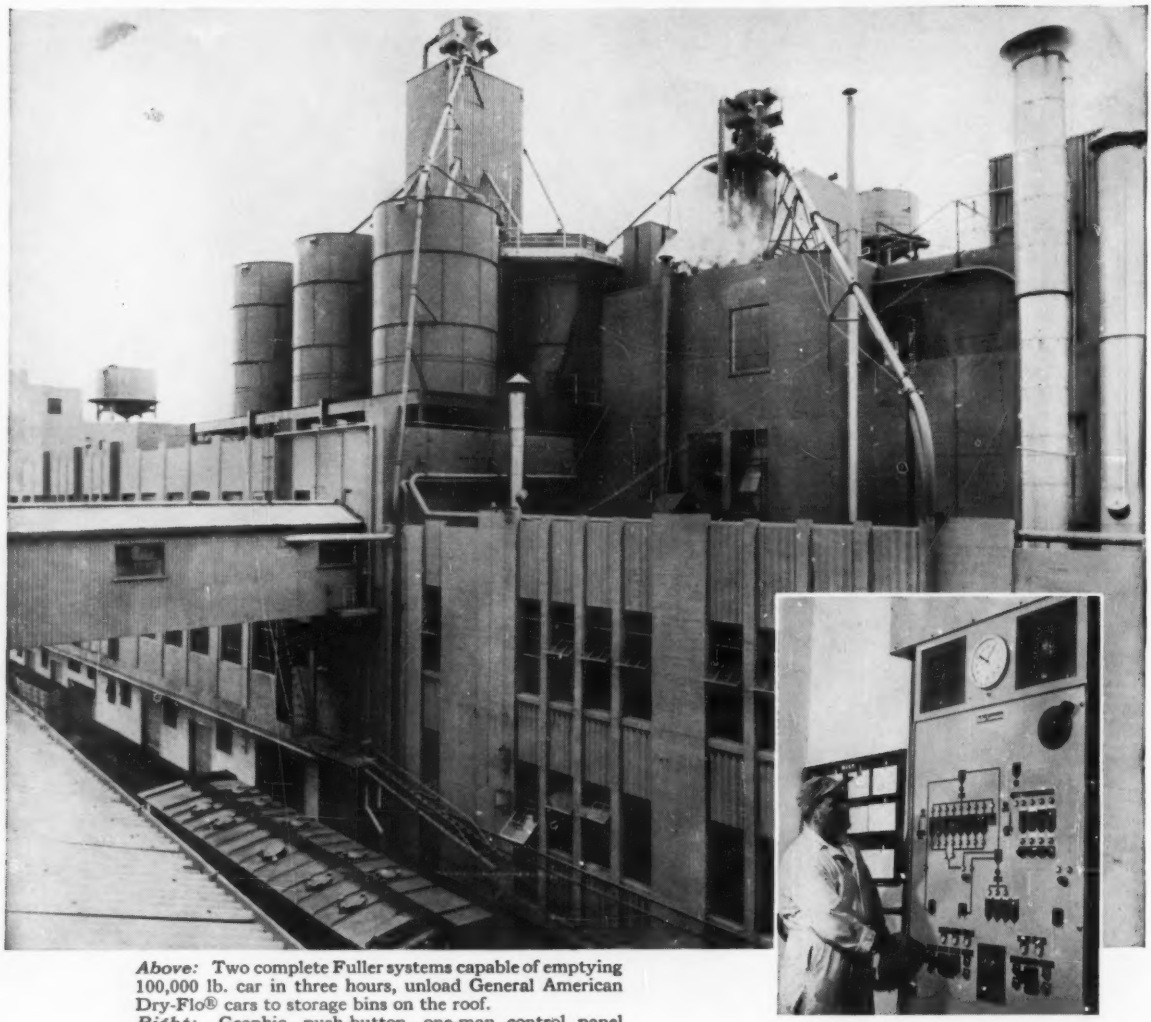


IMITATION RASPBERRY BY FIRMENICH

You get the direct and authentic reproduction of raspberries in their full perfection in Raspberry Flavor by Firmenich. For Firmenich took fully ripe raspberries, freshly severed from the stem, captured their delicate and fugitive flavor, and by original research reconstructed it with all its significant and desirable components. Firmenich Raspberry comes to you as a precise and potent flavor material of the utmost purity and stability to enhance the flavor of your products and to give them greater sales appeal. Samples and technical data on request.

FIRMENICH & CIE.
SUCCESSEURS DE
CHUIT, NAEF & CIE.
GENEVE SUISSE

FIRMENICH INCORPORATED
250 WEST 19TH STREET, NEW YORK 11
FIRMENICH OF CANADA, LIMITED,
346 WALLACE AVENUE, TORONTO
CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE
LOS ANGELES, 1756 MALCOLM AVENUE
GENEVA PARIS LONDON



Above: Two complete Fuller systems capable of emptying 100,000 lb. car in three hours, unload General American Dry-Flo® cars to storage bins on the roof.
Right: Graphic, push-button, one-man control panel handles unloading, conveying and reclaiming.

NO PLACE TO GROW BUT UP

. . . so Burgermeister put 12 new storage bins on the Brewhouse roof

Putting a head on beer is one thing, but putting a head on the Brewhouse roof might seem an insurmountable obstacle. This growing San Francisco brewery was up against it for storage space. With no further room for lateral expansion, the only place to grow was up—but how? Could additional bins be loaded at such a height?

Fuller engineers were able to provide the answer. Airveyor® Pneumatic Conveying Systems don't balk at height. So twelve additional bins were mounted on top of existing equipment, and two separate Airveyor systems were installed. They even incorporate components from an existing Airveyor system which had been installed in 1947.

Now, with ample storage space, grits are unloaded from covered hopper cars to bins in just over three hours per 100,000-lb. car. The same quantity of malt travels the route in a little over two hours. And reclaiming and blending are handled at an equally high rate—all controlled by one man at a Fuller graphic control panel. Burgermeister has greater production with greater economy — as breweries must do to keep ahead today.

The success of Fuller in handling problems like those at Burgermeister is confirmed by repeat orders from customers everywhere. Breweries nation-wide look to Fuller to study their needs for expansion, higher production and for new brewery installations. Why not find out for yourself why they do it—and what Fuller can do for you? 2625 A-29 2

FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY
114 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

Fuller
. . . . pioneers in harnessing AIR

Men & Companies

James L. Rankin

Rankin Named Foremost V.-P. . . . James L. Rankin, former v.-p. of Pillsbury Co., succeeds P. Reid Oliver as executive v.-p. of Foremost Dairies. Mr. Rankin will continue as a director of Pillsbury where he was responsible for industrial, public, trade, and personnel relations.

In addition to his Pillsbury affiliation, Mr. Rankin is a board member of the Millers National Federation, chairman of the Wheat and Flour Institute, and active in the Grocery Manufacturers Assn. He joined Pillsbury as advertising manager, later moving up to sales manager and eventually v.-p. of Grocery Products Div. In '58, he was elected to the board of directors. According to a Pillsbury spokesman, no successor will be named to fill his position. Mr. Rankin will be reassigned within the company.

Louis Ratzesberger, Jr.

Dole Ups Ratzesberger . . . Louis Ratzesberger, Jr., v.-p., director, and chief administrative officer of Dole Corp.'s Mainland activities, has been named executive v.-p. at Dole. Mr. Ratzesberger will continue, as before, in over-all charge of marketing, Mainland production, and related administrative activities, with headquarters in San Jose, Calif.

A former president of Illinois Canning Co. Mr. Ratzesberger also held posts as president of Illinois State Chamber of Commerce and National Canners Assn., as well as a directorship of Grocery Manufacturers of America.

Dr. H. C. Diehl

Frozen Food Pioneer . . . Dr. H. C. Diehl is recipient of the first Man-of-the-Year Award of the Frozen Food Trade Assn. of Delaware Valley. Dr. Diehl is an early pioneer in frozen food research, his first investigations beginning in 1924.

Internationally recognized as a specialist in the refrigeration of perishable commodities, Dr. Diehl established, and for 15 years was director of the Refrigeration Research Foundation. In 1960 he was appointed chairman of the Frozen-Foods All-Industry Coordinating Committee, in addition to his post as managing director of Trans-American Refrigerated Services, Ltd.

Personnel

Paul S. Willis has been re-elected president of Grocery Manufacturers of America.

Dr. C. H. Bailey, Dean Emeritus of the Institute of Agriculture at Univ. of Minnesota, is '60 recipient of Charles F. Spencer Award for outstanding work in agricultural and food chemistry fields.

Reid W. Jensen moves up to v.-p. of TreeSweet Products Co.

Frank E. Glotfelty, v.-p. and director of Corn Products Co., becomes executive assistant to the chairman, with **Robert C. Wheeler** suc-

The Answer to Your Wash-Up Problems!
INSTANT HOT WATER MAKER
Equipped with 50 foot hose, water saver and spray nozzle. Mixes Steam and Cold water with no chance of Steam Burns! Economical and easy to use.
OPEN WALL TYPE
Hot and Cold Water or Steam and Cold Water right where you need it.
RECESSED WALL TYPE
For concealed piping on new installations. This unit is removable and the entire assembly is covered by an attractive stainless
STRAHMAN VALVES, Inc.
NICOLET AVE., FLORHAM PARK, N. J.

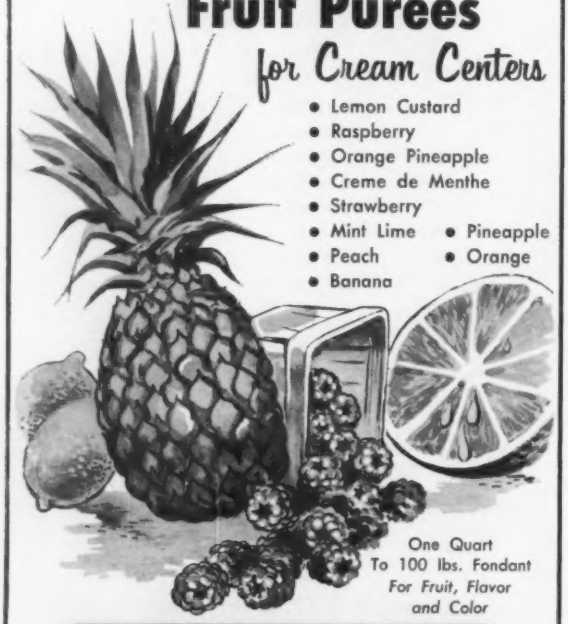
CIRCLE 91 ON READER SERVICE CARD

ILLÉS *Concentrated*

Fruit Purees

for Cream Centers

- Lemon Custard
- Raspberry
- Orange Pineapple
- Creme de Menthe
- Strawberry
- Mint Lime
- Pineapple
- Peach
- Orange
- Banana



One Quart
To 100 lbs. Fondant
For Fruit, Flavor and Color

A. E. ILLÉS COMPANY

Manufacturers of Fine Flavors

P. O. BOX 35412 DALLAS, TEXAS

CIRCLE 135 ON READER SERVICE CARD

ceeding him as manufacturing v.-p.

Charles H. Sanford, Jr., is now board member and sales v.-p. of American Maize-Products Co.

Charles R. Young is promoted to secretary and **Lyle M. Farmen** to controller at R. T. French Co.

Larry M. Kaner, sales v.-p. at Breast O' Chicken, resigned after 14 yrs. service.

Edgar D. Lewis, assumes financial v.-p. post at Lowrey's Foods, Inc.

David D. Patterson moves up to assistant v.-p. of Borden Co.'s Central Div.

Terrance Hanold is elected v.-p. and treasurer; **Arthur P. Loomis** and **J. Cy Rapp** elected v.-p.'s; and **Arthur H. Rixie** elected controller at Pillsbury Co.

Edwin W. Ebel, General Foods v.-p., is new executive committee member of Advertising Federation of America. **Russell Z. Eller**, Sunkist Growers advertising manager, is vice-chairman of plans committee for AFA's '61 Advertising Week campaign.

Tony E. Fulton and **Don P. Gundry** move up to v. p.'s of Standard Brands Sales Co.

E. B. Arnold moves up to director in charge of all Latin American operations for International division of General Foods.

Industry

Mission of California signed franchises with two German bottlers as part of accelerated development and expansion program.

Burry Biscuit Corp. announced acquisition of all capital stock of **Blue Jay Food Products Co., Inc.**

Charles E. Hires Co. tendered over 90% of capital shares to **Consolidated Foods Corp.** in response to CF's stockholder offer for purchase of Hires shares at $19/share, following acqui-

Particle handling in a

HEIL DRYER

means fast, uniform drying

Regardless of size, each particle is flash-dried to the same low, uniform moisture content in a Heil dryer. A 3-pass drying drum assures accurate moisture control in the finished product. Small particles move quickly through a stream of hot air to cooler zones, while heavier particles with more moisture move more slowly. Compound showering flights on each of the three cylinders keep particles moving evenly — no surging.

The result: fast, uniform drying — high production at low operating costs. You can depend on a HEIL! Why not check for yourself? Wire, write or call for complete details.

THE HEIL CO.

3000 W. Montana Street • Milwaukee 1, Wisconsin

MANUFACTURERS OF THE ARNOLD DRYER

A winning team needs a "strong bench"

When you buy Duraglas containers or their closures from Owens-Illinois, you acquire the rights to a "strong bench" of technical and merchandising skill.

On call are specialists in designing packages and making them perform efficiently in your plant and where your products are sold.

Ask your Owens-Illinois salesman. Call him at your nearby O-I office or write Owens-Illinois, Toledo 1, Ohio.

DURAGLAS CONTAINERS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO
PACIFIC COAST HEADQUARTERS • SAN FRANCISCO

CIRCLE 93 ON READER SERVICE CARD

our business is cereal...

and Werner automatic equipment is doing a top job for us, too!

If you are manufacturing a food product in which a baking process is involved at one or more vital points of production, you ought to know more about WERNER baking equipment. Famous in the cookie and cracker world as the creator of time and cost saving baking equipment, WERNER engineering is also serving other food industries with a variety of automatic, specially-engineered efficiency equipment.

WRITE FOR "case history" reports on WERNER'S role in such fields as dog foods, pretzels, cookies, crackers, cereal. Check your choice below and mail coupon for free information.

☐ COOKIES
☐ CRACKERS
☐ PRETZELS
☐ CEREAL
☐ DOG FOOD
OTHER:_____

MAIL TO:_____
FIRM:_____
ADDRESS:_____
CITY & STATE:_____

WERNER MACHINERY COMPANY
1765 Alpine N.W., Grand Rapids 4, Mich. USA
ENGINEERING AND EQUIPMENT FOR BETTER BAKING

94 CIRCLE 94 ON READER SERVICE CARD

Men & Companies

sition from Hires' family interests of 221,449 shares in August. Hires will operate as division of CF.

Mitchell Syrup & Preserve Co., Detroit, has joined **Beatrice Foods Co.**, Chicago, as a separate division, but retains its own label.

Gerber Products Co., acquired former supplier **Knoll & Co.**, manufacturer of Gerber baby pants.

Nalley's, Inc., Wash., and **IXL Food Co.**, Calif., merged. Both companies will retain individual identities and brands.

Coca-Cola and **Minute Maid Corp.** approved principle of proposal under which Coca-Cola would acquire MM through stock exchange. After formal approval of merger agreement by both boards, proposal will be submitted for approval by stockholders of both companies at special December meetings.

P. Ballantine & Son to begin $10 million construction and expansion program.

Campbell Soup Co., Ltd., Toronto, opened new multimillion dollar food processing plant in Manitoba and announced completion of another at Listowel, Ontario.

Pepsi - Cola International opened three new bottling plants in Wuerzburg, Germany; Ibadan, Nigeria; and Pietersburg, Union of South Africa.

Associated Industries

United States Testing Co. formed new Food Div. to provide broad and complete testing, R&D analysis, and product evaluation service for food industry.

S. M. Hopkins is new president and director of National Can Corp.

Henry L. Ford becomes president of Eastman Chemical Products, Inc.

Plax Corp. plans construction of new plastic container plant in Anaheim, Calif.

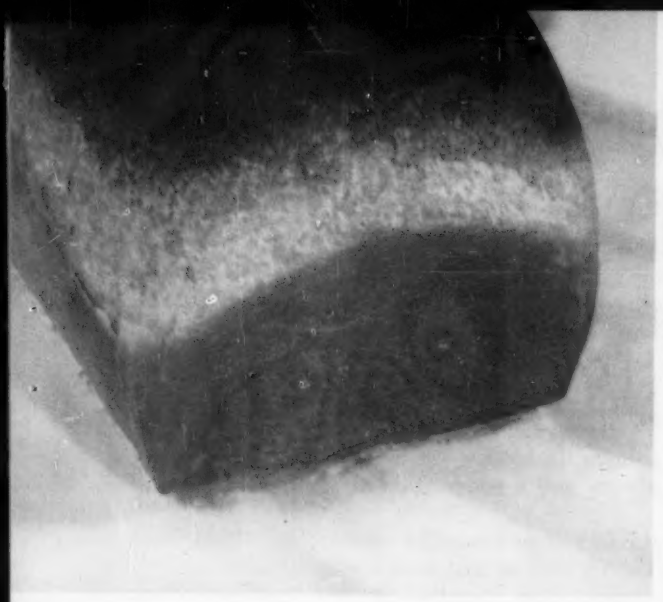
Lily-Tulip Cup Corp. completed construction of new technical center in Commack, Long Island. Building will house company's R&D facilities.

Brockway Glass Co. acquired **Celluplastic Corp.** in exchange for 52,000 shares of Brockway common stock. Finley B. Hess, Brockway president, announced that new subsidiary will operate under Celluplastic name.

Reynolds Metals Co. announces $1 million expansion and modernization program for plastic production facilities at Grottoes, Va., plant.

PEPPERIDGE FARM AND CAMPBELL SOUP AFFILIATION is confirmed as Henry A. Rudkin (left), Pepperidge board chairman, and his wife, Pres. Margaret Rudkin, shake hands with Campbell Pres. W. B. Murphy. Transaction involved exchange of outstanding Pepperidge shares for estimated $28 million in Campbell common.

CIRCLE 95 ON READER SERVICE CARD →



Flavorful, quality, eye-appealing foods...

naturally superior...when made with...

sugars, starches and syrups from

INDUSTRIAL DIVISION
CORN PRODUCTS
COMPANY

WRITE OR PHONE *Corn Products for expert technical assistance... helpful data on these fine products for the Food Industry:*
CERELOSE® dextrose sugar · REX® and GLOBE® corn syrups · BUFFALO® · HUDSON RIVER® and SNOWFLAKE® starches.

CORN PRODUCTS COMPANY INDUSTRIAL DIVISION · 10 East 56 Street, New York 22, N. Y.

A new bulletin gives information on MYVACET* Distilled Acetylated Monoglycerides, now approved for food use

Bulletin A-1 describes their advantages, includes a list of 69 pertinent scientific papers and patents, and a compilation of projected uses.

This information will be of interest to food processors in view of the recent official approval* of the use of these materials, up to 5% in finished foods, as a food coating agent, container component, equipment lubricant, or emulsifier.

*See Regulations of the Food & Drug Administration Sec. 121.1018

Other bulletins discuss specific applications of these interesting products

Foods in which the use of *MYVACET Distilled Acetylated Monoglycerides* would appear to be of greatest efficacy include poultry, frozen and processed meats, frozen fish, dried fruits, nuts and candies, and storage eggs.

Bulletins on each of these applications have been prepared to assist in new-product development programs. Poultry and meat uses may require further specific clearances from USDA; we shall be happy to assist our customers to get such approvals.

For copies of the bulletins, samples of different types of *MYVACET Distilled Acetylated Monoglycerides*, and quotations, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

FE SERVICE CENTER

Catalogs ..... p. 112
Books ..... p. 120
Patents ..... p. 122
Classified ..... p. 124
Advertisers Index ..... p. 127
Reader Service ..... Back of Book

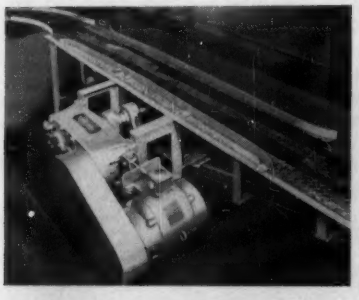
NEW EQUIPMENT & SUPPLIES

Efficient Air Filters Cut Maintenance Costs

Compressed-air filters that reportedly remove almost 100% of entrained dirt, oil, and water, normally operate for months without maintenance.

Units employ a unique operating principle by which air is scrubbed in a wet filter bed to remove dust particles down to 20 microns. In addition, oil and water particles coalesce into large drops which fall into a sump. Maximum flow rates range 20-200 scfm., and pipe sizes range ¼-2 in.—*King Engineering Co., P. O. Box 735, Ann Arbor, Mich.*

Circle 251 on Reader Service Card

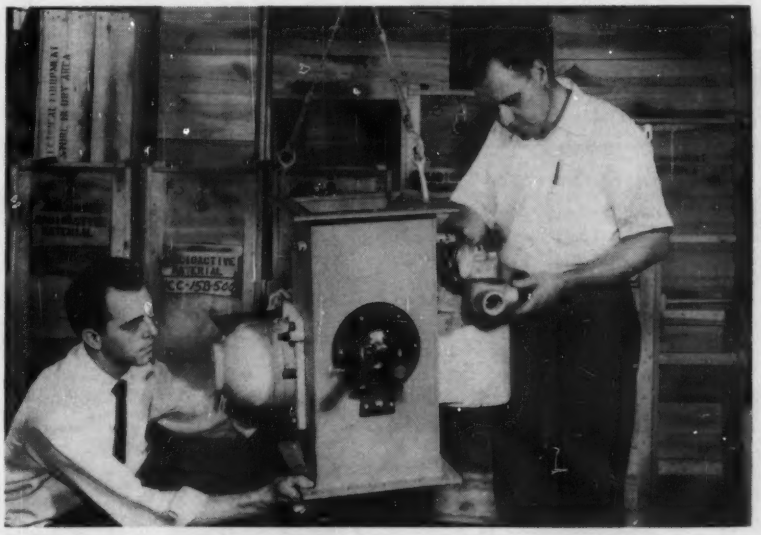


Cost-Cutting Power Unit

This new chain-conveyor power plant provides the longer pulls required of today's floor case and can conveyors. Thus fewer units are needed, which cuts maintenance and operating costs.

Advanced features include high torque capacity, quadruple gear reduction, and direct shaft drive. Overall efficiency is rated at 95%, and compact unit fits in a 22-in. pit without extending above pit cover. Of sanitary construction, models are available in 5- and 7½-hp. motor sizes, standard 1,800 rpm.—*Mojonnier Bros. Co., 4601 W. Ohio St., Chicago.*

Circle 252 on Reader Service Card



Radiation Unit Gages Flow of Solids

Flowrate of granular materials moving through a process may now be gaged and controlled continuously with this new equipment.

Unit employs a strontium-90 source, which emits beta rays, and a unique detecting cell that converts radiation directly to electrical energy. Latter is amplified to operate recorders and process controls.

In operation, beta rays contacting flowing solids cause emission of X-rays. These pass through the material to the conversion cell on the opposite side. Amount of radiation reaching the cell is proportional to quantity of material passing a given point at any instant.

Beta sources are used when stream velocities are high (10 fps.) and quantity is small. For slower flow rates (3 fps.) and large quantities, gamma sources are used. First application was measurement of a fine cement powder on a mass flow basis.—*Ohmart Corp., 2236 Bogen St., Cincinnati.*

Circle 253 on Reader Service Card

Double-Impact Vibrator

Seen speeding large quantities of hard-to-handle materials through bins and bunkers is a powerful magnetic bin vibrator using a double-impact system.

Known as Model 70U, vibrator's hammer strikes an anvil at both top and bottom of stroke, which imparts 7200 sledge-hammer blows per min. against bin wall. Semi-resilient impact elements minimize noise. Unit is quickly and easily installed on chutes, hoppers, and variously shaped bins with walls to ½-in. thick and up to 50-ton capacity. No special wiring or rectifier is needed.—*Eriez Mfg. Co., Erie, Pa.*

Circle 254 on Reader Service Card

Instant Dough Development Eliminates Up to 5 Hr. of Processing Time

Doughs can now go from scaling to baking in two hours with use of a new instant developer.

Called Reddi-Sponge, it employs functional ingredients (whey, l-cysteine, potassium bromate) to develop the dough instantly and subsequently condition it. This eliminates the sponge period in dough development, thus only 15-45 min. of floor-time are required.

Costs are cut in two ways. First, savings result from elimination of time, labor, and fermentation loss associated with the sponge process. Secondly, capital investment in troughs, hoists, mixers, etc., is reduced, and floor space now used for pre-fermentation can be reclaimed.

Product is readily adapted to any yeast-fermented dough formula. Basically, it provides a straight-dough system with instant conditioning comparable to the "dough-extensibility" of the sponge process.—*Western Condensing Co., Appleton, Wis.*

Circle 255 on Reader Service Card

Unique Limit Switch

Considerably longer service life is reported for a new vane-operated limit switch that makes no physical contact with the moving object. There are no sliding or rotating parts, shafts, levers, or actuating arms.

Instead, unit is actuated by passage of a separate steel vane through a recessed slot in the switch. Either the vane or the switch can be attached to the moving part of a machine. As vane passes through slot, it alters the balance of a magnetic field, causing contacts to operate.—*General Electric Co., General Purpose Control Dept., Bloomington, Ill.*

Circle 256 on Reader Service Card

Multi-Purpose Lubricant

Installed in seconds, this multi-purpose lubricant cartridge fits any lever-type gun.

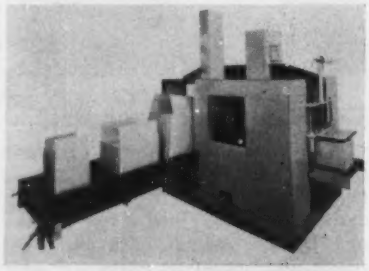
Called No. 88 X Light, the lubricent is recommended for plain and anti-friction bearings, and for use on rotating or sliding surfaces. It is water repellent, unaffected by heat or cold, resists mild acids and alkalis. Standard packaging is 25 14-oz. cartridges per carton.—*Keystone Lubricating Co., Philadelphia.*

Circle 257 on Reader Service Card

Seals Vari-Size Cartons

This closing machine adjusts automatically to seal corrugated containers of varying sizes. Compact machine requires only 5x7 ft. of floorspace.

Called Randomatic Case Sealer, unit handles 12 cartons per min. It can seal top and bottom of boxes up to 18x20x30 in., and then regulate itself to close small boxes down to 4x8x10 in. which may be following.



Machine applies a thermoplastic sealant which sets in less than 3 sec. This eliminates need for a long compression section to insure top and bottom closures. As box enters machine, an internal mechanism moves in from its outer limits until it meets resistance of box. Once carton is sealed, mechanism returns to its outer limits and awaits next unit.

Filled cartons enter machine

NIAGARA "no frost"

THE BEST OPERATION IN FROZEN FOODS

● Niagara "No Frost" lifts the penalty that icing puts on large operations in freezing foods or warehousing them. It gives you all the benefits of continuous production with FULLY automatic refrigeration and protects you from losses of valuable perishables by assuring you always full capacity from your refrigeration plant and your operation running smoothly when you need it most... during peak loads. You save labor and power and get lower cost figures both in operation and upkeep. You can get a plant design that is efficient.

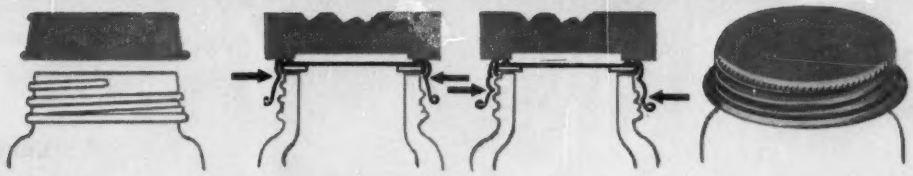
Write for Bulletin No. 105

NIAGARA BLOWER COMPANY

Dept. FE-12, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities

EACH CAP...



The unthreaded aluminum closure is placed on the jar and seated on sealing surface with a controlled uniform pressure.

Rollers revolve and form the closure by shaping the skirt against the glass threads. Since the protective liner is not turned against the glass lip during sealing, there is no cutting or scoring of the liner and no danger of air leakage.

A CUSTOM FIT!

WITH ALCOA'S NEW ALUMINUM SCREW-ON CAP

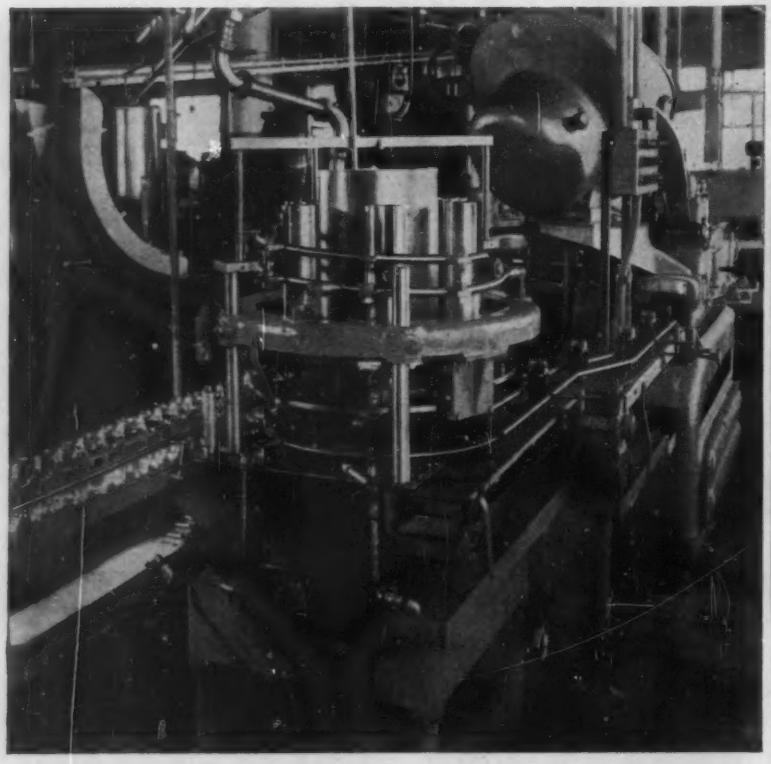
Alcoa's Roll-On process means that every aluminum cap is tailor-made to fit each jar, regardless of maximum and minimum tolerance. And because of this individual fitting, the contents of every baby food jar are getting the best protection available today. The Roll-On process also insures maximum production efficiency with minimum downtime.

Acid-resistant, corrosion-resistant aluminum caps are friendly to food. Straight meats cannot affect the aluminum cap liner. And Alcoa® Aluminum caps stay bright and clean... never tarnish. So where protection counts ...you can count on Alcoa Aluminum caps. Nine out of ten mothers prefer them. We invite your inquiry. Write Aluminum Company of America, Box 2047-L, Pittsburgh 19, Pa.

ALCOA ALUMINUM

Better Packaging

FLUIDICS* AT WORK



How to fill even viscous hot fudge with speed and accuracy

If you have problems filling heavy or viscous products accurately without losing speed, consider the experience of the Robert A. Johnston Company with their six-station Pfaudler® rotary piston filler.

Mr. A. O. Meyer, Plant Manager, says, "The Pfaudler filler has been giving us some very good results. We fill approximately 55 six- or eight-ounce jars per minute with heavy hot fudge without a spill. And we also package caramel, butterscotch and chocolate syrup.

"The filler takes only about a half hour to clean thoroughly. We've had very little maintenance with it. In fact, all it really needs is a routine cleaning and lubrication."

The RP-6 filler is the smallest in the Pfaudler line . . . an ideal model for filling small lots of a number of products. Change-over for various container heights takes only about 12 minutes. Other models of the rotary piston filler will handle up to 1050 cans a minute. All these fillers are rated to ±0.1 fluid ounce accuracy for most products.

If you'd like the full story on the complete line, write to our Pfaudler Division, Dept. FE-120, Rochester 3, New York.

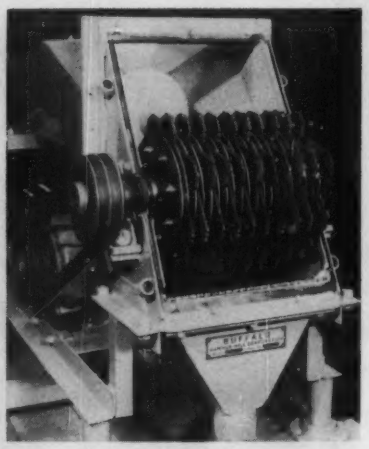
*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS...the science of fluid processes

with bottom flap folded but unsealed, and top flaps unfolded. Rods fold inner and outer flaps on top of carton and box is held under pressure as it passes to sealing section. — *Union Bag-Camp Paper Corp., New York City.*

Circle 258 on Reader Service Card

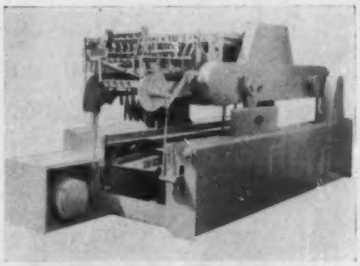


Waste-Disposal Unit

Of hammermill design, this unit offers simple and sanitary food-waste disposal. It handles all such wastes except banana stalks and corn husks.

Machine starts automatically when water valve is open and stops when valve is closed. A worm feeder prevents overloading regardless of amount of material fed into hopper. Models are available in 3 and 5 hp.—*Buffalo Hammer Mill Corp., Buffalo, N. Y.*

Circle 259 on Reader Service Card

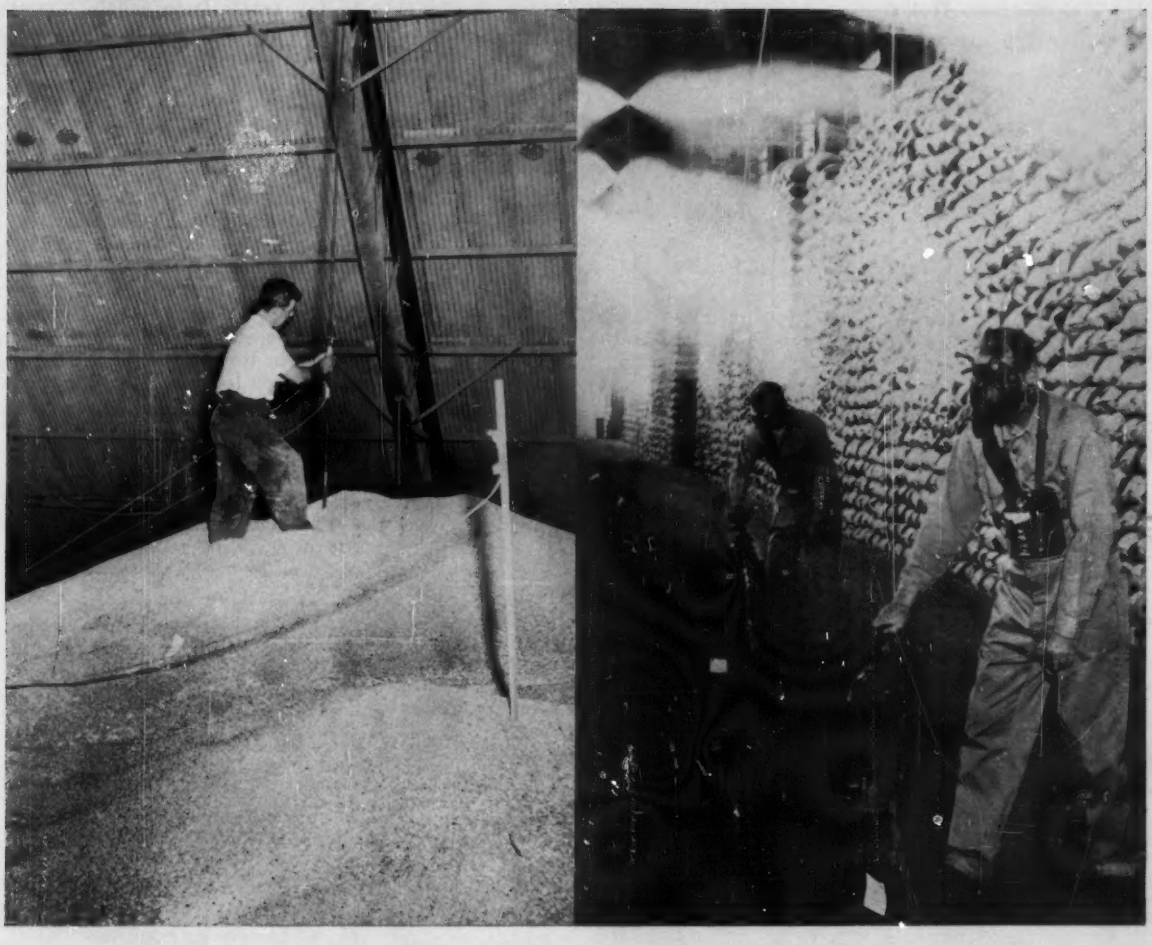


Packs 32 Cases/Min.

Featuring continuous motion, this unit packs bottles, cans, and jars, up to 32 oz., in standard return cases or shipping cartons (including four flap type) at speeds to 32 cases per min.

Called Model CP-30, it uses interchangeable packing heads that accommodate various sizes and types

DOW | FUMIGANTS



From storage bins to processing plants . . .

PROTECT STORED PRODUCTS WITH DOW FUMIGANTS

Whether you store bulk food, process it, or ship it, there's a Dow fumigant designed to protect your products from devouring or damaging attacks by over fifty different types of insects and rodents.

Use Dow Methyl Bromide for almost every method of fumigation – space, chamber, tarpaulin, boxcar or forced-air recirculation of bulk grains. Methyl Bromide quickly penetrates throughout all parts of the stored product; controls all forms of insects and rodents; and leaves no residual tastes or odors.

Use Profume® (98% methyl bromide, 2% chloropicrin) for the same applications, but where a slight warning odor is desired.

Use Picride® (80% methyl bromide, 20% chloropicrin by weight) in loosely constructed buildings where there might be a question of holding a lethal concentration of methyl bromide. Or if insects infest your processing machinery –a treatment with Dowfume® EB-15 will give a fast initial kill, and long-lasting residual control.

Used according to directions, Dow Fumigants will impart no residual odors or taste to grain or fully prepared commodities, they will not affect milling qualities, they present no appreciable fire risk . . . they are the most economical insurance you can have for protecting your investment in stored products.

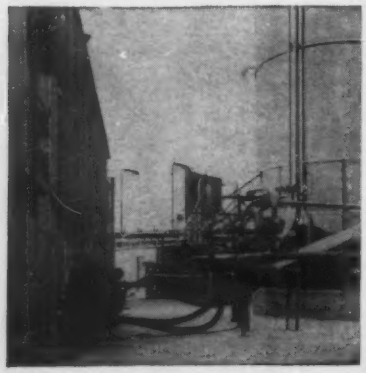
Call your nearest Dow sales office for full information on the proper Dow Fumigant for your storage application. Or write: THE DOW CHEMICAL COMPANY, Agricultural Chemicals Sales Department 224KE12, Midland, Mich.

Products Advertised Herein Comply with U. S. Law
When used as directed on label and in accordance with good practice, they comply with the Food and Drug Law and other Federal Laws.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN

Problem:

To cut costs and gain floor space in flour handling operations



Solution:

SPROUT-WALDRON

PNEUMATIC SYSTEM

In addition to the standard savings of 12¢ per bag which automatically applies when you shift from bag to bulk flour, Chef Boy-Ar-Dee, Milton, Penn., gained these advantages with the Sprout-Waldron pneumatic system:

1. Faster handling
2. Lower operating costs
3. Simplified maintenance
4. 10,000 square feet of floor area
5. Improved housekeeping

The system picks up from rail cars and delivers the flour to storage at rates of 20 tons per hour. It then transfers it 600-700 ft. to plant bins at rates of 6000 pounds per hour. Heat exchangers incorporated in the system keep the flour at proper blending temperature at all times.

For the full story of savings at Chef Boy-Ar-Dee request Bulletin 1-54.

CW/108

SW SPROUT-WALDRON

Muncy, Pennsylvania

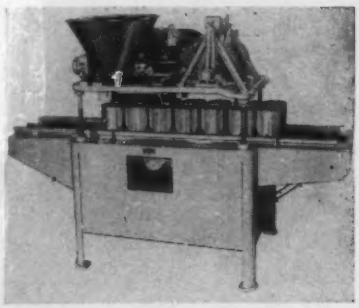
Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

Equipment & Supplies

of containers. Complete change-over takes about 20 min.

Conveyors route cases and containers through packer. Packing drop is accomplished by simple cams and mechanical linkages—no complex reciprocating mechanisms. Unit is protected by automatic controls, and requires the casual attention of only one operator.—*Geo. J. Meyer Mfg. Co., Milwaukee.*

Circle 260 on Reader Service Card

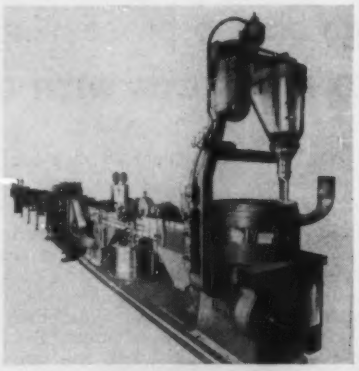


High-Speed Twin Filler

For high-speed filling of viscous and semi-viscous products, this twin unit simultaneously fills two glass, tin, or aluminum containers from pint to gallon sizes.

Simple adjustments provide for precise fill control, variable container heights, and desired production speed. An adjustable bottom fill mechanism lifts containers over filling nozzles to minimize air pockets and reduce foam.—*Elgin Mfg. Co., Elgin, Ill.*

Circle 261 on Reader Service Card



Offers Faster Filling

High-speed auger feeding on this automatic carton-filling and sealing machine promises production speeds up to 400 units per min. for such items as desert powders, pancake mixes, gelatine, and powdered sugar.

Instead of relying upon product to fall freely from supply hopper as with straight volumetric devices, it is driven down by rotating action of an auger. In addition to increased operating speed, better control over product flow is achieved and early tests indicate greater filling accuracy.

In operation, flat seamed cartons are automatically opened then bottom sealed. As cartons enter filling section, funnels arranged on perimeter of revolving head fit themselves in the open tops. Funnels' knife-like edges pass under auger to divide the product stream into increments for exact fill. Top flaps are then glued and folded down.

End opening cartons of practically any type can be handled from 1 oz. to 3 lb. sizes with dimensions of 3x2x¾ in. to 12¾x8¾x3¾ in. —*FMC Packaging Machinery Div., Stokes & Smith, Philadelphia.*

Circle 262 on Reader Service Card

Now More Versatile

This refuse-container handling unit so broadens the versatility of maker's equipment that it reportedly serves as a complete system for heavy materials handling as well as general refuse collection and disposal for most plants.

Known as "Dinomaster," unit consists of a compaction body and two cab-clearance lifting arms. It can be operated as a self-loading packer when automatically pulled up on the skid frame and locked in place. In operation, it approaches a refuse container, engages the side channels, lifts it over the cab, and empties contents into its compaction body. There, material is squeezed to a fraction of its former volume by a 60,000-lb.-thrust packer plate.

Containers range ½-8 cu. yd.—*Dempster Brothers, Knoxville, Tenn.*

Circle 263 on Reader Service Card

(continued on p. 107)

fur by Revillon...

...flavor by Webb

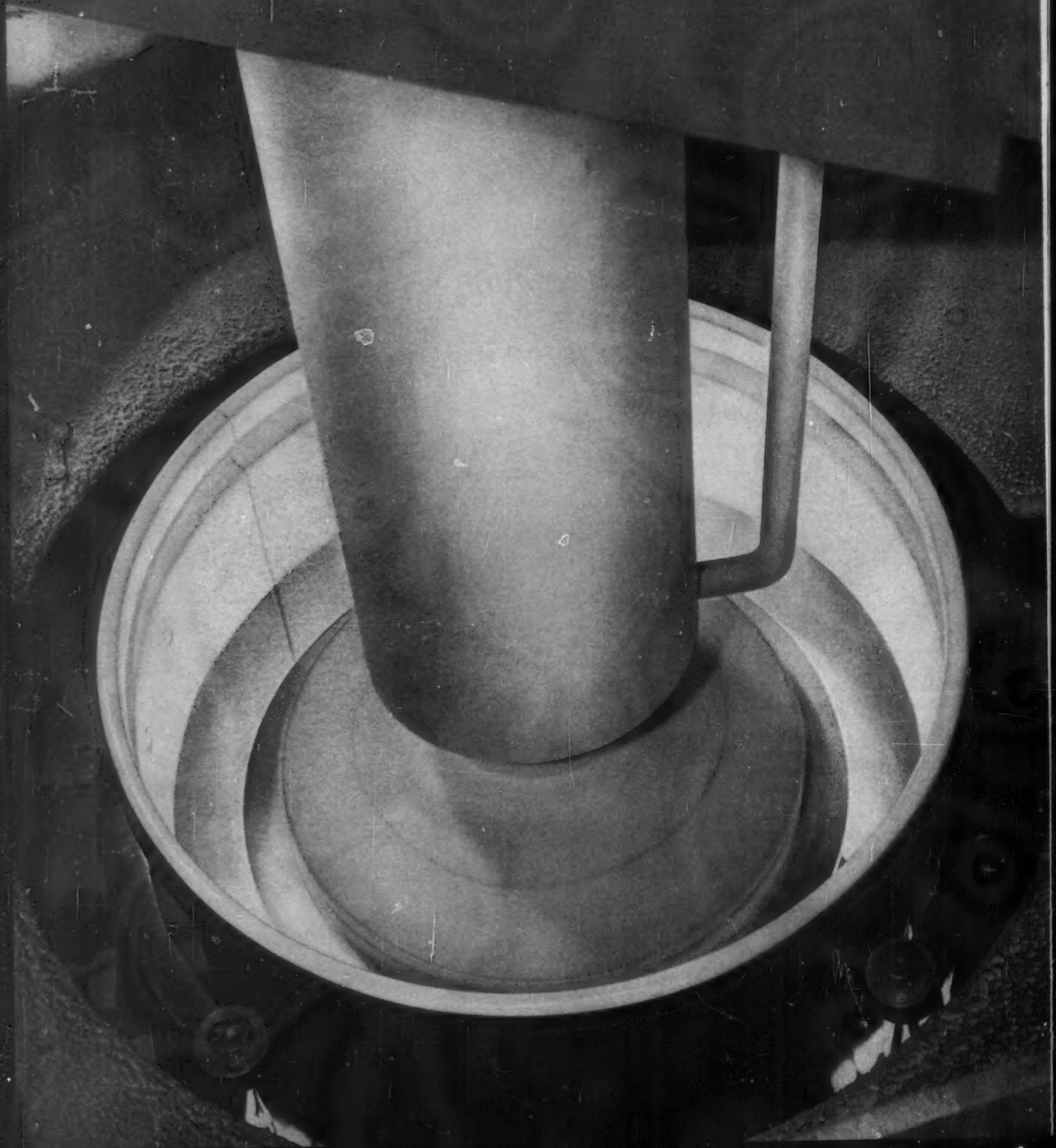
Today's consumer
is quality conscious
— at all price levels.
That's why you have an added edge
when you use food flavors by Webb
— outstanding for trueness,
delicacy, uniformity and strength.
Specialists in standard flavors and
custom flavor development
for over fifty years.
Inquiries invited.
Catalog on request.

R. D. WEBB & CO., INC.

Main Office: Linden, New Jersey
Branches: Cos Cob, Conn.; Chicago; Los Angeles

Announcing!

RHEEM CENTRIFUGAL-LINED PAILS...



...new process now makes pail linings completely dependable

Overhead view on the opposite page shows a protective coating being applied to the interior of a five-gallon pail by the new, Rheem Centrifugal Lining Method.

Developed solely for lining cylindrical container interiors, the Rheem Centrifugal Lining method is the first pail-lining process that is not merely an adaptation of painting equipment. In this exclusive process the fine lining particles pass from the circumference of the rapidly spinning applicator head to the container body by centrifugal force.

Unlike ordinary methods, air pressure is not needed to carry the lining particles. Solvents are therefore reduced; air turbulence is eliminated; the grease and grit of compressed air lines are avoided.

This means that foreign particles are not trapped under the lining to emerge as pinholes and blisters in the lining after the curing process. The filled product can't react with the steel to form contamination, nor will the lining flake off into the product. Because air turbulence is eliminated, a uniform thickness is deposited on the entire pail surface.

Lining is applied as the pail is automatically raised and lowered past the spinning applicator head. The space from the edge of the head to the wall of every pail is always the same. The angle of application is constant.

Result: lining thickness is controlled to fractions of a mil even in such difficult areas as the bottom crevice and beads. One gallon of filled product gets the same uniform protection as the next.

The Centrifugal Process, being automatic, eliminates the chance of operator fatigue or inattention and resultant skips in the film.

The Rheem Centrifugal Pail Lining process is based on the Rheem technique for lining drums—a technique proved superior in more than three years of use.

• • •

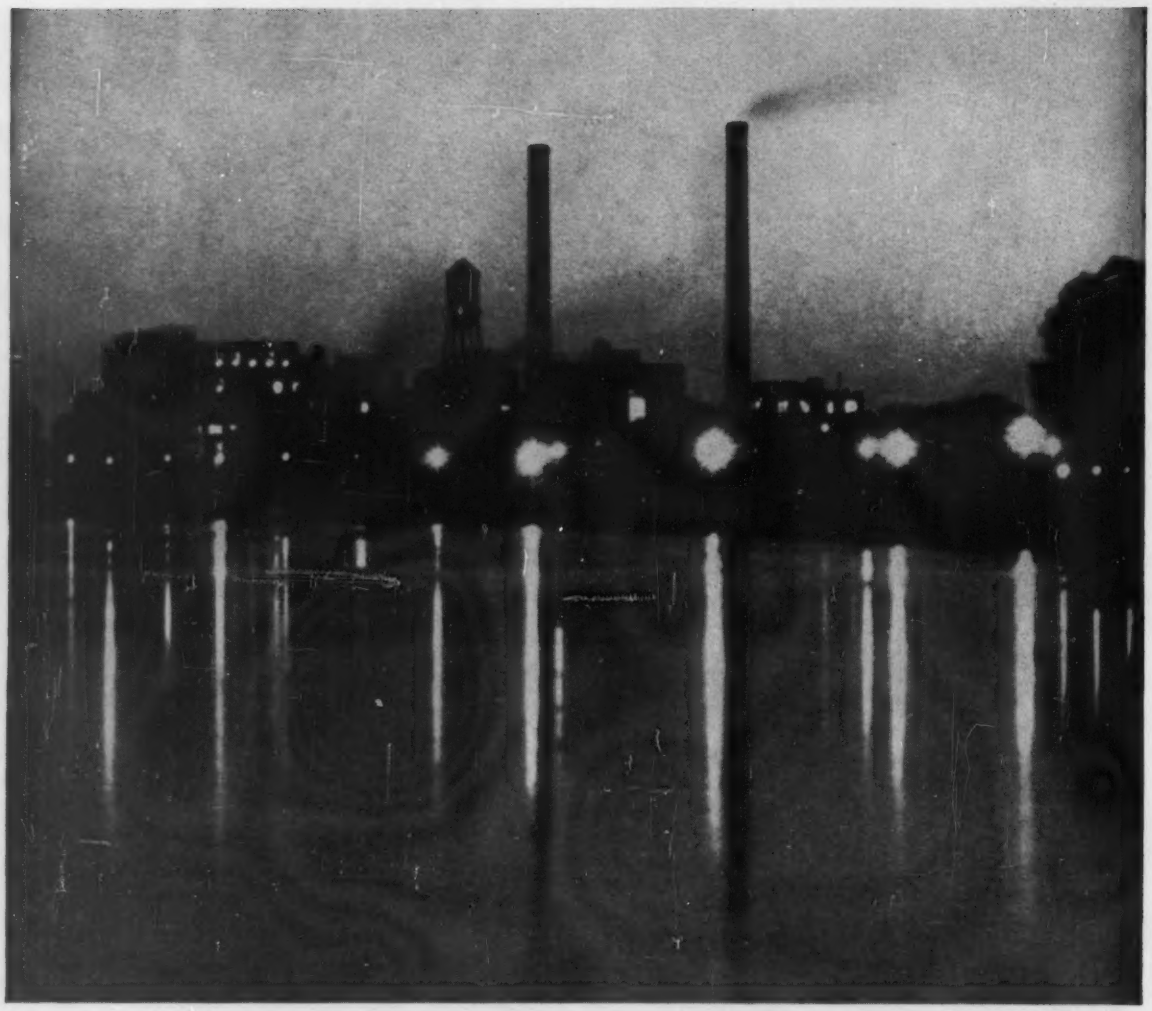
For samples, tests, or information on linings, write the world's largest manufacturer of steel shipping containers at 1701 West Edgar Road, Linden, New Jersey. Plants across the country – Chicago; Freeport and Houston, Texas; Linden; New Orleans; Richmond and South Gate, California; and Tacoma, Washington. For other offices see the Yellow Pages.

Pail shells (left) move up to Centrifugal Lining equipment. Positioning arms clamp pail, raise it past spinning applicator head. Angle, distance and speed never vary.

Result: Centrifugal-Lined pail (top) shows uniform coverage that provides dependable protection. Compare it with conventionally lined pail (bottom). Uneven coverage on seam, thin (dark) spot in bead may lead to product contamination.

WORLD'S LARGEST MANUFACTURER OF STEEL SHIPPING CONTAINERS

Rheem



24 HOURS A DAY

A Better Processed Food for you with Clinton Products from corn

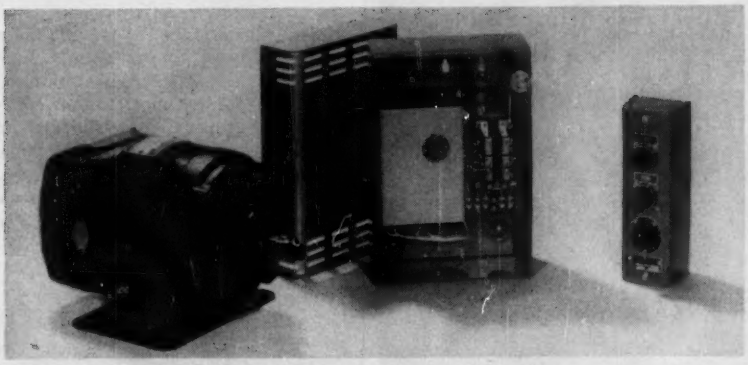
corn syrups • corn starches
Dextrose • Refined corn oil
Lactic Acid

See your Clinton salesman today.

CLINTON TECHNICAL SERVICE is freely available upon request.

CLINTON

CLINTON CORN PROCESSING COMPANY, CLINTON, IOWA



Unique Static Drive Offers Instant Starting

Low cost, compact, and efficient, this adjustable speed drive offers applications previously considered unsuitable for electronic units because of cost, size, and performance limitations.

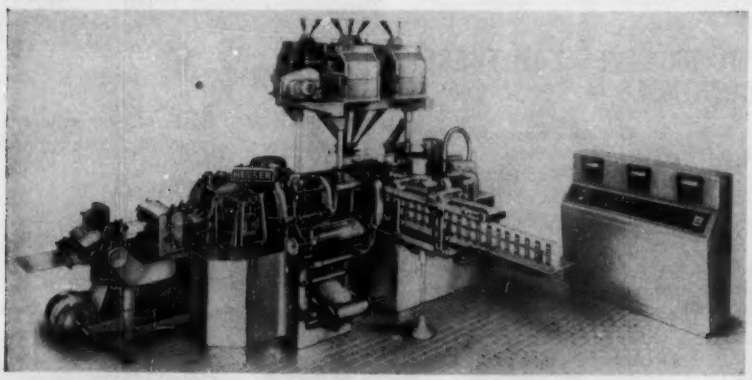
Key component of the fractional-horsepower drive (Statotrol) is the control module, which combines a tiny silicon-controlled rectifier and simplified, encapsulated circuitry. With potentiometer and disconnecting means, it constitutes a complete control for starting, stopping, and adjusting the speed of a d.c. motor.

Rectifier converts a.c. to controlled d.c. for smooth, stepless motor operation. This solid-state device provides instant starting because it eliminates warm-up necessary for filaments of tube-type drives. It also ups drive efficiency by eliminating energy required to maintain the cathode of an ordinary tube at rated temperature.

Unit operates under extreme environmental conditions with minimum maintenance, and is shock and vibration resistant.

Available in standard ratings from 1/20-¾ hp. with standard speed range of 8:1, drive may be operated over a wider range in intermittent duty. It is designed for 115-v, 50/60 cycle, single-phase power supply, and operates from any standard voltage with suitable transformer.—*General Electric Co., Schenectady, N. Y.*

Circle 264 on Reader Service Card



Bag Maker-Filler Feeds Film Liner From Reel

Designed for forming, filling, and closing Pliofilm-lined coffee bags, this unit reportedly is the first of its type to feed both liner and outer paper from reels. First installation was in a Canadian plant, where equipment is said to be in continuous satisfactory operation at speed of about 60/min.

In operation, liner is formed around a mandrel, then long seam and bottom are fin-sealed. Outer paper is glued around liner to produce a water- and airtight seal. Coffee is packed by maker's double precision weighers, then filled bags are vibrated and closed.

Called Model PDBR 3f, unit oc-

OLOFSSON
HIGH SPEED WEIGHER
(Pat. Pend.)

SPEED
Run up to 90 charges per minute

ACCURACY
1/20 Ounce plus or minus
For Semi-flow and Free-Flow products

Check your products losses by hundreds of pounds per shift.

Send sample of your product for FREE DEMONSTRATION

Write for details — Dept. FE

OLOFSSON CORPORATION
2727 LYONS AVENUE
LANSING, MICHIGAN

PACKAGE AUTOMATICALLY WITH A *HAYSSEN RT!*

SAVE $250.00 A DAY

on packaging material costs alone.

Above: Typical installation of the Hayssen RT at the Monroe, Wisconsin plant of Armour Cheese. This newly installed machine packages sliced Munster, American and Swiss cheeses in six ounce packages directly from roll stock. The machine forms a hermetically sealed, gas-flushed package.

ONLY THE FULLY AUTOMATIC RT GIVES YOU THESE PACKAGING ECONOMIES —

• **LOWEST PACKAGING MATERIAL COSTS** – The RT forms its package from economical roll stock rather than the more costly preformed pouch used in most semi-automatic packaging lines. You save .5¢ per package on material costs, or over $250.00 on an average production rate of 50,000 packages per day. Add to this the labor savings realized when you change to a fully automatic system of packaging.

• **FASTER SIZE CHANGES** – The RT is the only automatic packaging machine which does not need change parts to change package sizes. Simple hand wheel adjustments for height and length, film change for width control package size.

• **BEST PACKAGE** – Store owners appreciate the space savings feature of the RT end-sealed package. Three of these superior packages can be displayed in the space normally required to display two of the older four-side seal packages.

See how the HAYSSEN RT can save you money — write for details today!

first in Automatic Packaging since 1910

HAYSSEN

MANUFACTURING COMPANY • DEPT. FE-116 • SHEBOYGAN, WISCONSIN

Offices in principal cities. Check your phone directory.

Atlanta • Boston • Chicago • Columbus • Dallas • Denver • Detroit • Evansville, Ind. • Jackson, Miss. • Kansas City Minneapolis • New York • Philadelphia • St. Louis • San Francisco • Montreal • Toronto • Vancouver

Equipment & Supplies

cupies about 14 x 12 ft. of floor space, and all major components are easily accessible. An automatic height-adjusting mechanism compensates for possible variations in product density.—*Fr. Hesser Co., Stuttgart-Bad Cannstatt, Germany.*

Circle 265 on Reader Service Card

Offers Valve Automation

Operated by air pressure, this valve is seen as an integral part of today's automated systems.

Known as Automatic Valve, it provides a visual signal of valve position. It is turned on and off from any part of the plant by push-button, or its operation may be incorporated into a pre-set automatic cycle.—*G & H Products Corp., 5718 52nd St., Kenosha, Wis.*

Circle 266 on Reader Service Card

BRIEFS

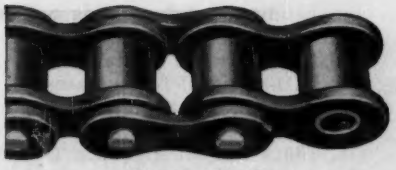
Inspection Light offers efficient checking of empty and filled glass bottles for general appearance, color, and fill. Sodium-vapor units are available for inspection of semi-opaque containers.—Terriss-Consolidated Industries, 22 Wooster St., New York City.

Circle 267 on Reader Service Card

Compact Truck Tractor (Model BC-1895) accommodates 40-ft. trailers, keeping overall length within 50 ft. With 197-hp. V-8 engine, unit is rated at 55,000 lb. GCW. Standard equipment includes 5-speed transmission and 2-speed 23,000-lb.-capacity rear axle. Wheelbase lengths: 137, 149, and 167 in.—International Harvester Co., 180 N. Michigan Ave., Chicago.

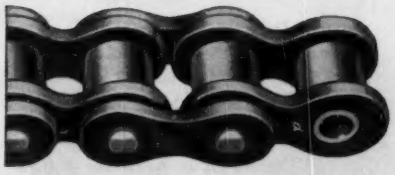
Circle 268 on Reader Service Card

(Continued on page 112)

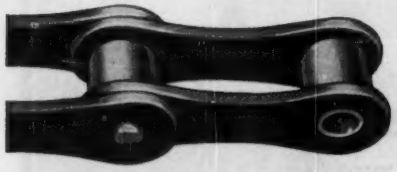


SINGLE STRAND

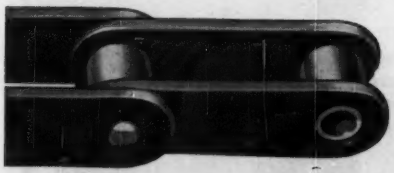
DOUBLE STRAND



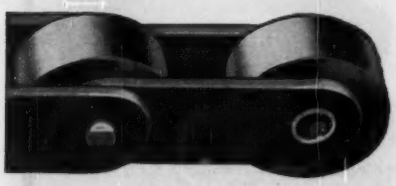
SINGLE STRAND, HEAVY SERIES



DOUBLE PITCH TRANSMISSION

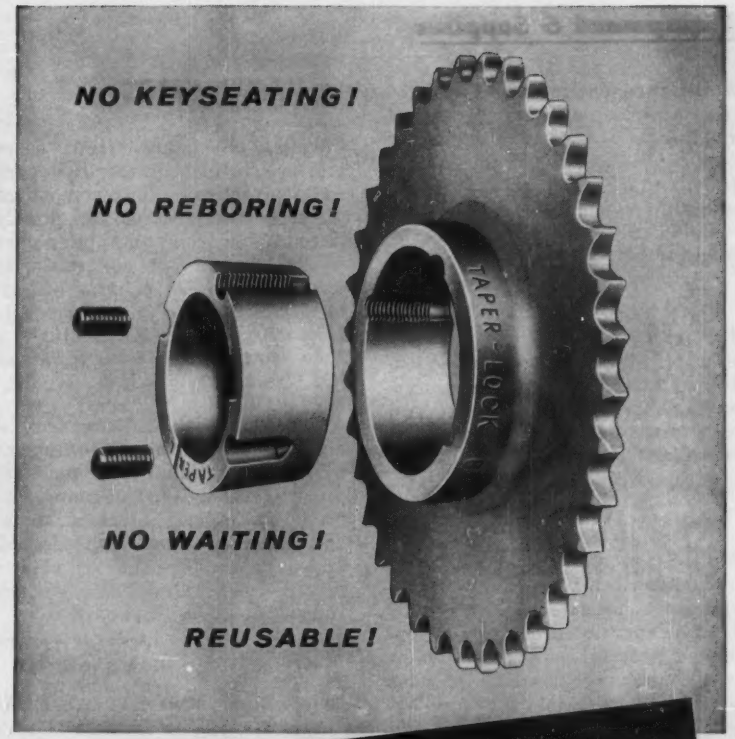


DOUBLE PITCH CONVEYOR



DOUBLE PITCH CONVEYOR, LARGE ROLLERS

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."



TAPER-LOCK SPROCKETS DODGE ROLLER CHAIN

DODGE Quality Roller Chain, teamed with Dodge Taper-Lock Sprockets, results in chain drives and chain conveyors that have the precision, efficiency and stamina necessary for the real economy of *long life*.

Moreover, Taper-Lock's reusable bushing makes a difference in overall cost. The ease of Taper-Lock mounting, the elimination of reboring, keyseating, and wasted time, add to the saving. Precision machining and true articulation lengthen the life of *both* sprocket and chain.

The Dodge line of chain, including standard attachments, is extensive. It meets a high percentage of all chain requirements.

In the Double Pitch series (both Transmission and Conveyor) the sizes which require special spacing for perfect tooth action are offered from stock in special double pitch design — to double the life of the chain and the sprocket!

Ask your local Dodge Distributor. Or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 2800 Union St., Mishawaka, Ind.

DODGE
of Mishawaka, Ind.

Full-Range pH Meter (with 0-1,400 mv. scale) permits easy direct reading to 0.02 pH unit, accuracy to 0.05 unit. Scale is mirror-backed to eliminate parallax error, and minimum sample volume is 3.5 ml. —Coleman Instruments, Inc., 42 Madison St., Maywood, Ill.

Circle 269 on Reader Service Card

Partial Opening Switch for maker's cold-storage doors limits opening to 32 in. for foot traffic, thus saving time and curbing refrigeration loss. Door closes automatically.—Clark Door Co., 182 Rose St., Newark, N. J.

Circle 270 on Reader Service Card

Multi-Stage Controller programs various switch functions in a continuously repeated count cycle. Unit (Programonitor) can be operated by rotating shaft to count revolutions, reciprocating lever for strokes, and solenoid for electrical impulses. — Counter and Control Corp., 4503 W. Brown Deer Rd., Milwaukee.

Circle 271 on Reader Service Card

NEW SUPPLIES

Chemical-Resistant Grout eases and speeds installation of quarry and ceramic tile. Two-component material (Epox-E-Set) is quickly mixed on the job and applied over wet or dry tile or concrete. No waxing of tiles or priming of surfaces required. — Cambridge Tile Mfg. Co., Box 71, Cincinnati.

Circle 272 on Reader Service Card

Aerosol-Dispensed Silicone simplifies cleaning of process equipment by curbing product adhesion. Applied to sealing bars of semi-automatic packagers, odorless, tasteless material (Camie) speeds and improves heat-sealing of plastic films.—Camie Co., 9225 Watson Industrial Park, St. Louis.

Circle 273 on Reader Service Card

New Lining Materials are FDA-approved for use in hopper cars and storage bins in contact with grains and processed foods. First (Kem Cati-Coat #9) is a two-package, catalyzed epoxy coating with high abrasion, chemical, and water resistance. Other (Carclad #9) has MID-approval for surfaces in contact with meat products and shortening. — Sherwin-Williams Co., Industrial Maintenance Div., Cleveland.

Circle 274 on Reader Service Card

INGREDIENTS

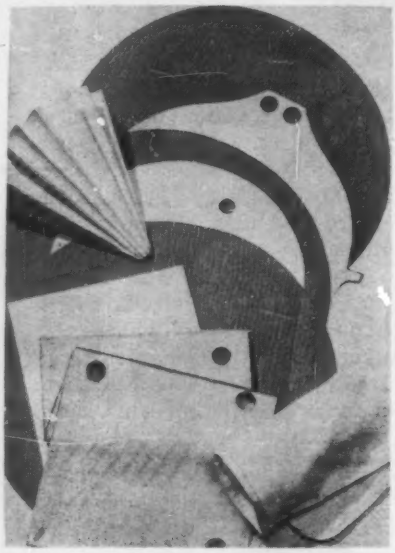
Dough Extender reportedly improves make-up of bread, roll, and bun doughs by hand or machine, also grain and texture of finished goods. Tablets (IDX) are dissolved in water and added at dough-stage-mixing time. — Food Industries Co., Dallas.

Circle 275 on Reader Service Card

Antioxidant for fats and oils (Dilauryl Thiodipropinate) has FDA approval for use at levels up to 0.02% of food's fat content.—Halby Products Co., Wilmington, Del.

Circle 276 on Reader Service Card

Supplying Food Processors is Our Business



. . . May we serve you?

FILPACO FILTER MATERIALS

FILTER PAPER: quickest service, latest converting equipment, most complete range of filter paper grades. SAMPLES furnished or send us your materials for testing. FILTER CLOTH: cotton, wool, felt, glass, Orlon, Nylon, silk, Dacron, polyethylene, Filyon, Saran, non-woven fabrics, and others cut and sewn to required shapes and sizes.

FILPACO STAINLESS STEEL TANKS

for storage and mixing; all styles including vertical, horizontal and rectangular . . . open or closed . . . in stock or fabricated to your exact specifications. FILPACO TANKS mean higher quality, lasting satisfaction, more value.

Hundreds of food processors use FILPACO PRODUCTS!

WE INVITE YOUR INQUIRY! We manufacture a complete line of filters, filter materials, tanks, mixers and fillers.

FILPACO INDUSTRIES
THE FILTER PAPER CO.
2450 S. Michigan Avenue, Chicago 16, Illinois

a little
cmc
makes
a
big
difference

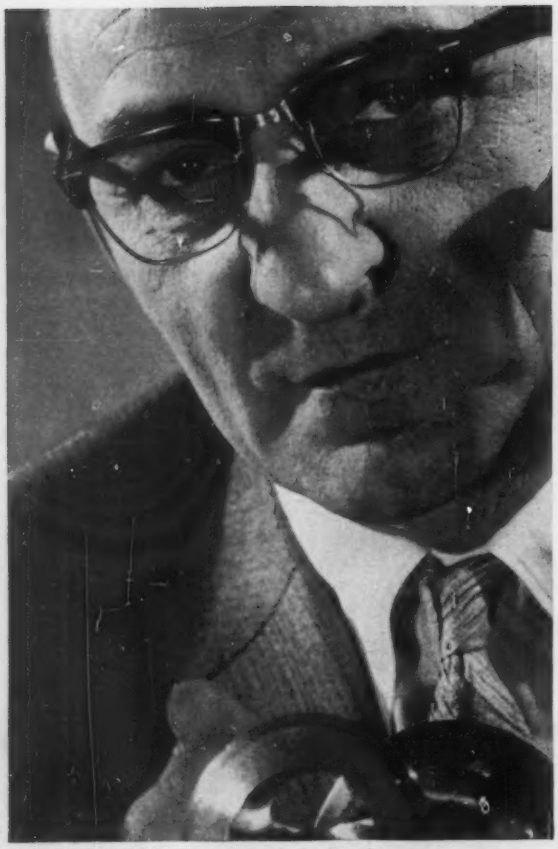
Here's a topper—cherry, whipped toppings, sprinkles, ice cream—enough to make any young man's eyes pop. In whipped toppings, cellulose gum, Hercules purified CMC, is used as a stabilizer.

Hercules cellulose gum is finding ever-increasing uses in a variety of food products because of its purity, consistent quality control and dependable supply. If you are a food processor you probably know about CMC. If you want to know more, we'll be glad to send you complete technical information on your requirements and work with you on your specific formulation if you request. For further assistance, write:

Hercules Cellulose Gum

VC60-9

Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware



ALFRED MENGO — Chairman of the Board.

ANYTHING

new and valuable is the by-product of an intelligent stubbornness . . . . . a respect for ideals that forces us to live a little beyond ourselves. Its most gratifying reward is found in serving satisfied clients. Valves, Pumps and Sanitary Dairy Fittings are products you may have an occasion to purchase. We mean to see that the products and performance adhere to all the highest possible industry standards.

G AND H

Write for complete information.

G & H Products Corporation
5718 Fifty-Second Street, Kenosha, Wisconsin

Just Off the Press

PLANT ENGINEERING

Motor Windings. Illustrates and describes room temperature vulcanizing silicone rubber protection for units subjected to moisture and other contaminants. 4p.—General Electric, Waterford, N. Y. (308)

Hot Water Tanks. Contains prices and data on standard units to 6570 gal. and heating elements to 33,000 GPM. 7p. — The Sims Co., Inc., Erie, Pa. (317)

Sight Glasses. Includes property data and installation information on complete line. 4p. — Corning Glass Works, Corning N. Y. (318)

Balancing Valve. Outlines dual purpose hot water unit which replaces two valves on water coil return line. 4p. — American Air Filter Co., Louisville, Ky. (319)

Door Interlock Switches. Data sheet covers three series of units with thermoplastic actuating rods. 2p.—Micro Switch, Freeport, Ill. (320)

Flexible Shafts. Indexed handbook brings engineering data up to date and simplifies unit selection. 89p.—S. S. White Industrial Div., N. Y. C. (321)

Plastic Filters. Describes porous Teflon and porous Kel-F with listing of standard forms. 4p. — Porous Plastic Filter Co., Inc., Glen Cove, N. Y. (322)

Water Heaters. Describes and illustrates eight models of steam injection type for high or low pressure use, ranging from 500 to 50,000 GPH. 2p.—Scott, Inc., Milwaukee, Wis. (323)

Pressure Relief Valve. Catalog sheet details new unit used in water, oil, air or gas to initial 4000 psi. pressure. 2p.—Atlas Valve Co., Newark, N. J. (324)

Colored Stainless Steel Provides general information, characteristics, and applications of firm's line offered in color variety. 5p.—Washington Steel Corp., Washington, Pa. (325)

Speed Reducers. Introduces firm's redesigned and expanded line of "balanced design" parallel shaft units in 57 sizes. 36p. — Link-Belt Co., Chicago, Ill. (326)

Heat Transfer Digest, Summarizes complete line of products with explanation of thermal and mechanical advantages. 4p. — Brown Fintube Co., Elyria, O. (327)

PACKAGING

Polymer Instability. Contains information on light and oxygen effects on polyethylene, polypropylene, and polyvinyl plastics with details on new counteracting stabilizer.—Guardian Chemical Corp., Long Island City, N. Y. (345)

Strapping Machinery. Details automatic units. Includes manually-operated tools, materials, seals, and accessories. 60p.—A. J. Gerrard & Co., Des Plaines, Ill. (347)

Laminated Foil. Gives standards for aluminum foil in various laminations with paper and board. 12p.—Laminated Foil Manufacturers' Assn., Providence, R. I. (348)

Liquid Packaging. Provides descriptive data on new automatic liquid filling machine that forms, fills, and seals pouch-type containers. 2p.—Speedway Machine & Tool Co., Inc. (349)

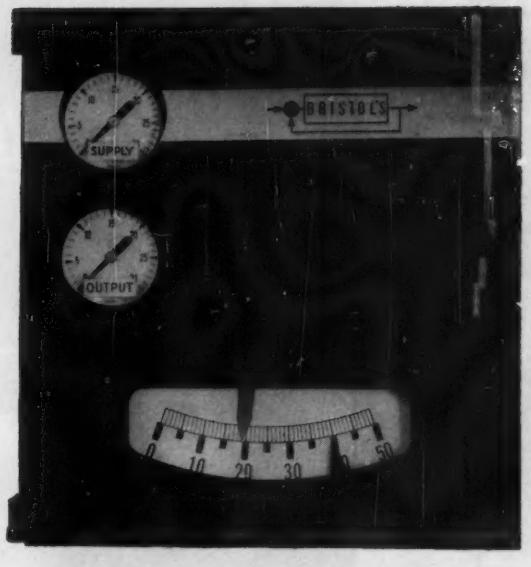
MATERIALS HANDLING

Screw Conveyors. Gives specs and applications of standard and industrial gastight units. 7p. — Sprout Waldron & Co., Inc., Muncy, Pa. (364)

Hand Trucks. Describes four, low-lift, battery powered models designed for

(continued on page 115)

NEW BRISTOL'S



Series 624 A/D* pneumatic controller features simplicity and high control stability

- **Simple modular design for ease of servicing**
- **High control stability for closer process control**
- **Designed for batch-type and continuous processes**
- **Proportional and proportional-plus-reset control models available**

Top control performance with maximum simplicity plus standard Bristol precision measuring elements – those are the key features of the Bristol Series 624 Controller. The 624 uses the same renowned elements that have earned such a reputation for accuracy and dependability on other Bristol automatic controlling and recording instruments – perfected through wide experience and many years of development.

Self-contained modular design of the control unit speeds servicing. The whole modular unit, consisting of an aluminum casting with working parts made of stainless steel, Ni-Span C, and Neoprene diaphragms, can be removed by taking out only two screws and a link.

Outstandingly compact, the aluminum instrument case (only 8" x 8" x 5" overall) is completely weatherproof. It is designed for either flush, surface, panel, or valve mounting. Attachments for pipe mounting (2-inch pipe) are available. Write for complete data on the versatile and economical 624 A/D. The Bristol Company, **115** Bristol Road, Waterbury 20, Conn. 0.35

**Advanced Design*

CONTROLLERS OFFERED FOR:

PRESSURE AND VACUUM: Ranges from full vacuum to 10,000 psi.

TEMPERATURE: Ranges from −100°F to +1000°F.

FLOW AND DIFFERENTIAL PRESSURE: With mercury-type manometer and dry-type differential unit.

LIQUID LEVEL: With bulb unit and mercury manometer and dry-type differential unit.

HUMIDITY: Zero to 100% relative humidity.

CONTROL UNIT CHARACTERISTICS:

PROPORTIONAL BAND: 0-400% continuously adjustable, direct- or reverse-acting.

RESET: 0.1 to 50 repeats per minute.

AIR PILOT: Non-bleed type.

PILOT CAPACITY: 3.0 scfm.

FREQUENCY RESPONSE: Flat to 300 cycles per minute.

TEMPERATURE STABILITY: Less than 0.25% change in the output pressure for 90°F temperature change.

MATERIAL: Aluminum housing; 316 stainless steel internal parts; Ni-Span C feedback element.

BRISTOL... for improved production through measurement and control

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

VERTICAL FULL-CURL FLANGE. This popular container is ideal for frozen foods and bakery products. Full-curl rim makes fast, tight covering possible. Manual or automatic closure equipment is available from Ekco-Alcoa on a sale or rental basis.

SMOOTHFOIL. The first rigid foil container to offer a true hermetic seal. Keeps moisture-sensitive items with complete safety. It is available in natural aluminum or a wide range of colors.

RIBFOIL. An entrancing new foil package, both in the store and on the table. Fluted sidewalls add strength and beauty. Brilliant colors are economical to apply. Available with bowed or vertical sidewalls.

SPECIALTY CONTAINERS. Unusual shapes for special needs. The heart container shown here is only one of many intriguing shapes Ekco-Alcoa has created.

Why foil packaging?

Rigid aluminum foil packaging is selling product after product. Few packaging shapes are beyond its reach. Foil wears a variety of colors with unique brilliance, compliments printing and embossing.

Light, strong, moisture-proof, odorless, tasteless, non-toxic, dimensionally stable—these inherent foil characteristics insure full protection. You can safely freeze in foil. And your customers can cook and serve in the same aluminum package.

Production advantages are numerous. Easy stacking, for instance. And easy filling and closing with manual or automatic closure equipment, which is readily available on a sale or rental basis from Ekco-Alcoa. From every standpoint, rigid aluminum foil is a versatile packaging material.

The Plus Container®

EKCO-ALCOA CONTAINERS INC.

WHEELING, ILLINOIS · WHITTIER, CALIFORNIA · LONG ISLAND CITY, NEW YORK

EKCO is the registered trademark of Ekco Products Company. ALCOA is the registered trademark of Aluminum Company of America. The corporate name and combination mark, EKCO-ALCOA, is used under license to the manufacturer by each of these companies.

Just Off The Press

palletized materials. 8p. — Clark Equipment Co., Battle Creek, Mich. (367)

Conveyors. Contains illustrated installations of inclined belt units for interfloor handling. 6p.—Rapids-Standard Co., Inc., Grand Rapids, Mich. (368)

Storage Rack. Introduces all-new adjustable unit with unique two-part upright frame and shelf beam assembly. 7p. — Palmer-Shile Co., Detroit, Mich. (371)

Side Shifter. Gives specs and illustrations of unit designed to move load 4" to either side of center without moving truck. 1p. —Lewis Shepard, Watertown, Mass. (372)

Bulk Material. Provides information on complete system to solve bulk material handling problems. 32p. — Tote System, Inc., Beatrice, Neb. (373)

Narrow Aisle Trucks. Details electric walkie models with dual voltage system. 4p.—The Raymond Corp., Greene, N. Y. (369)

PROCESSING

Revolver Feeders. Describes and illustrates "blow-through" model for handling dry, pulverized, and granular materials in high pressure pneumatic conveying systems. 2p.—Fuller Co., Catasauqua, Pa. (328)

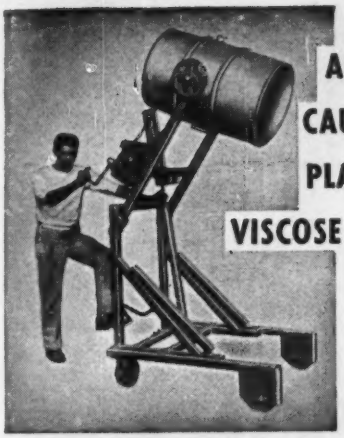
Liquid Dispenser. Features "Electro-Portioner" for automatic, accurate, adjustable addition of liquids. 2p.—Hardy Salt Co., St. Louis, Mo. (329)

Sensing Device. Contains cross-sectional diagrams and specs of unit for detection and control of process variables. 2p. — Yarnall-Waring Co., Philadelphia, Pa. (330)

Batch Weighing. Details manual and automatic electric systems including applications. 20p. — Gilmore Industries, Cleveland, O. (332)

(turn page)

CONTROLLED POURING



OF

ACIDS
CAUSTICS
PLASTICS
VISCOSE MATERIALS

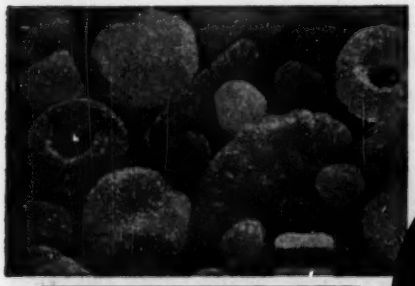
with the Model CP-1 Sterling Hydraulic Drum Lift. Be assured of self-locking and absolute control at any pouring angle.

Lifting capacity 750 lbs. Lifting height 72". For complete details and specification on the CP-1 model and other model Sterling Hydraulic Drum Lifts, write: Dept. FE-12

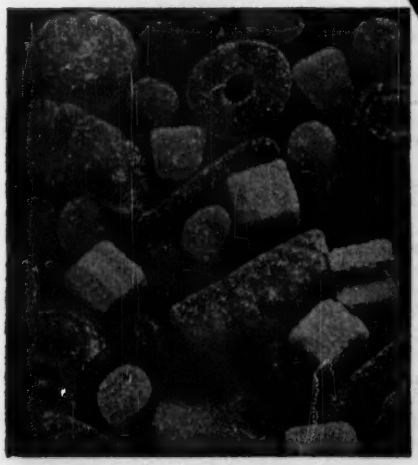
STERLING, FLEISCHMAN COMPANY

P. O. Box 94 Broomall, Pa.

CIRCLE 136 ON READER SERVICE CARD



CONFECTO-JEL
Especially made for Jellied Candies



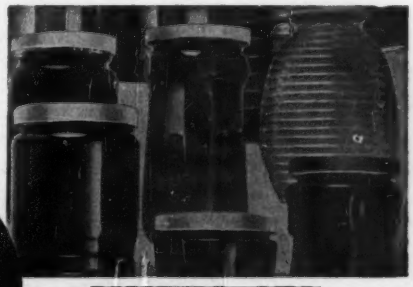
for better product consistency and quality
Always Depend On

SPEAS
APPLE PECTINS
35 years

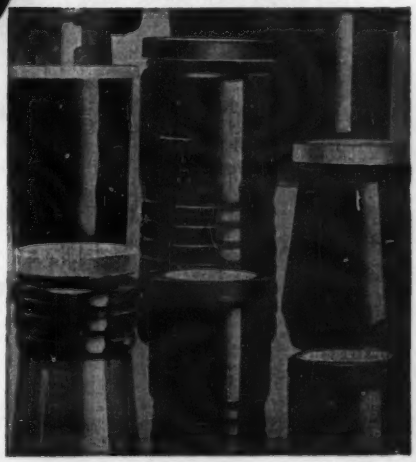
- Adaptable to wide range of PH levels.
- Neutral color and flavor—blends naturally with more different fruits than any other pectin.
- Gives product resiliency to avoid breakage during shipping.
- Improves spreadability of jams, jellies and preserves.
- Standardized to uniform strength so that product always has the same consistency.

Write, wire or phone for full information, technical advice, or location of nearest warehouse.

SPEAS COMPANY
DEPT. FE-12
GENERAL OFFICES • KANSAS CITY 20, MO.



NUTRL-JEL
Regular and Slow Set
For Finest Jams, Jellies and Preserves



Sheftene Sodium and Calcium Caseinates improve the quality of your product line in either, or both, of these basic ways:

I

SHEFTENES are a source of high-quality milk proteins, with an abundance of lysine and tryptophane. As such, they are unsurpassed for improving the protein quality of foods—wheat and grain products particularly.

II

SHEFTENES are versatile *functional* ingredients. They are used — efficiently and economically — to enhance the texture, appearance and shelf-life of bakery, cereal, dairy, meat products, beverages, infant foods and many others.

SHEFTENE products come in powder form, are soluble and possess no marked flavor or odor characteristics of their own. Write today for samples and technical data to Dept. FE-1260.

SHEFFIELD CHEMICAL
Norwich, N.Y.
A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION
Western U.S. distribution through
Van Waters & Rogers, Inc. — Seattle, Spokane, Portland, Dallas, Houston
Braun-Knecht-Heimann Co. — San Francisco, Salt Lake City, Denver
Braun Chemical Company — Los Angeles, San Diego, Phoenix, Albuquerque, El Paso

Continuous Feeding. Covers newest information on unit for continuous feeding of bulk dry materials. 4p. — B-I-F Industries, Providence, R. I. (337)

Processing Equipment. Catalogs firm's complete equipment line for milling, food, and chemical process industries. 24p.—B. F. Gump Co., Chicago, Ill. (338)

Ice Cream. Deals with ingredients, processing methods, and product formulas; geared to needs of small manufacturer.—Pennsylvania State Univ., University Park, Pa. (340)

Sprayers & Dryers. Discusses atomization techniques sprayer dryer designs, and flexibility of centrifugal atomization. 4p. — Bowen Engineering, Inc., North Branch, N. J. (341)

Electric Heaters. Illustrates, diagrams, and describes various types and sizes of thin band units for circular containers. 4p.—Acra Electric Corp., Franklin Park, Ill. (343)

SANITATION & MAINTENANCE

Floor Surfacing. Describes epoxy-base for tough wear and chemical resistance. 4p. — Ralph V. Rulon, Inc., Philadelphia, Pa. (350)

Floor Plate. Stainless steel's safety and economy features are highlighted with types, applications, and specs. 8p.—Eastern Stainless Steel Corp., Baltimore, Md. (351)

Waste Treatment. Contains comprehensive information on units for total oxidation of any capacity. 6p.—American Well Works, Aurora, Ill. (352)

Insect Killer. Features new actuator with metered precision and unattended control. 1p.—Syncro-Mist Sales Corp., Richmond Hill, N. Y. (353)

Lubricating Gun. Details new lightweight, portable, air-operated unit for large scale valve lubrication. 6p. — Rockwell Manufacturing Co. Pittsburgh, Pa. (354)

INSTRUMENTS

Alarm Systems. Provides general information and applications of electronic units for discovering and reporting refrigeration failure.—Emco Sales Co., Griffith, Ind. (378)

Process Control. Covers all-electronic systems, capacitance actuated level detection and control instruments, and malfunction detectors. 7p.—Robertshaw-Fulton Controls Co., Richmond, Va. (379)

Data Processing. Contains step-by-step illustrations and explanations of applications in business and industry. 28p. — Friden, Inc., San Leandro, Calif. (380)

Weighing System. Introduces combination scales and calculators for low cost, semi-automated performance. 2p. — Exact Weight Scale Co., Columbus, O. (382)

Temperature Controls. Contains detailed specs of firm's line including transistor circuits and thermister sensing elements. 8p.—Fenwal, Inc., Ashland, Mass. (385)

Smokehouse Control. Outlines automatic system that closes exhaust damper when pre-set weight loss is reached. 4p. — Calgon Co., Pittsburgh, Pa. (387)

Automation Efficiency. Discusses methods for increasing efficiency of data reduction and automation systems. 9p.—Monitor Systems, Inc., Fort Washington, Pa. (388)

INGREDIENTS

Catalysts. Properties and uses are given for commercially proven types used in food processing. 16p. — Chemetron Corp., Louisville, Ky. (358)

Additives. Gives wholesale price list for essential oils, citrus concentrates, aromatic chemicals, fixatives, and others. 11p.—Fritzsche Bros., Inc., N. Y. C. (359)

Aerosol Food Formulations. Contains complete informa-

(continued on page 119)

Permagloss belt conveying meat patties into freezing tunnel at Duffey plant in Carrollton, Ga.

How Permagloss conveyor belting cut labor cost 50% for the Duffey Sausage Company

DUFFEY packs frozen meat specialties — steakettes and hamburger patties. Formerly, these had to be placed in trays, picked up by hand, carried into the freezer, left to freeze, carried out again and broken free of the trays.

Now the meats are placed directly on the moving Permagloss conveyor belt, and carried into the -12°F. freezer, where they freeze solid. They then drop off the belt onto the packing table without being touched. This achieves continuous in-line production that eliminates excessive handling.

Result: The direct labor cost for the entire process has been cut in *half*.

Lasts For Years

Permagloss belting is made of DuPont Mylar® and Firestone Vinyl. In temperatures from below zero to 275° F. it remains dimensionally stable without embrittlement, cracking or crazing. Permagloss also has high abrasion resistance and tear strength. It can be flexed almost indefinitely without fatigue. A Permagloss belt lasts for *years*, often outwearing other conveyor belting materials several times over!

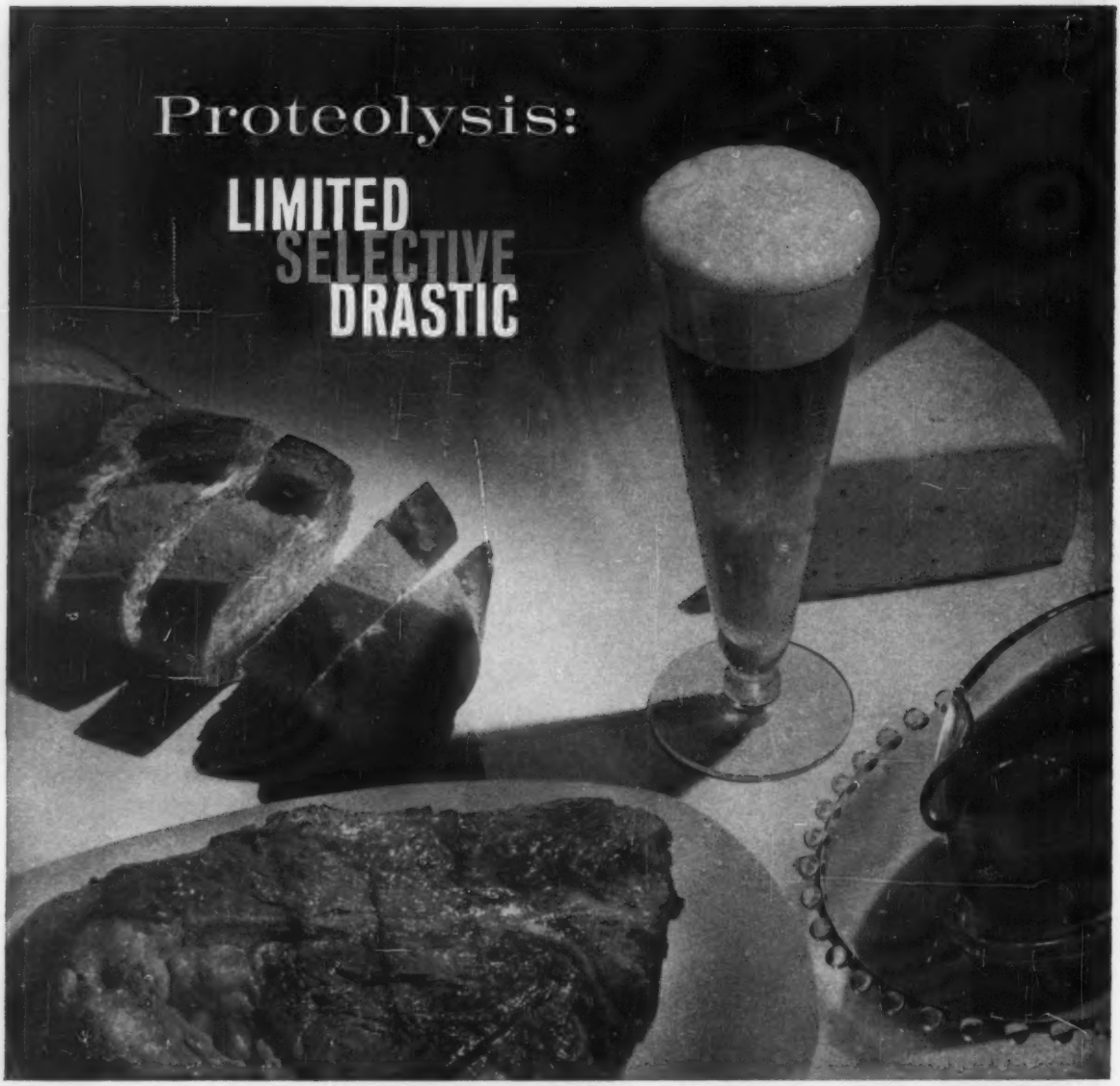
Ideal For Foods

The mirror-smooth Permagloss carrying surface is completely resistant to oils, greases, fats, solvents, moisture and almost all acids and alkalis. It remains odorless and tasteless *with no maintenance except wiping*, and does not support bacteria growth.

Permagloss is the ideal belting for food handling. It will replace most types of conventional conveyor belting, and usually costs less! Write today for a free Permagloss sample and complete technical information.

LASSITER
CORPORATION
1143 E. FOURTH STREET • CHARLOTTE 4, N. C.

NEW YORK, N.Y. • CHICAGO, ILL. • CHELTENHAM, PA. • ATLANTA, GA. • GREENSBORO, N.C. • DANVILLE, VA.
DESIGNERS AND MANUFACTURERS OF PRINTED PACKAGING IN FILM, FOIL, PAPER, PAPERBOARD



TAKAMINE Proteases for any degree of proteolysis in baked goods, beer, meats, fish, cereals, chocolate and protein hydrolysates. Miles offers you the most complete line of proteases available. Specific proteases to meet your specific needs. Proteases that help increase product quality, that help reduce processing costs. Write for complete information on the wide variety of protease enzymes from Takamine. All inquiries handled promptly.

TAKAMINE® (*pronounce it) Tack-a-ME nee)

Miles Chemical Company
DIVISION OF MILES LABORATORIES, INC.,
ELKHART, INDIANA

General Sales Offices: Elkhart, Ind., Telephone COngress 4-3111; Clifton, N.J., Telephone PRescott 9-4776; New York, N.Y., Telephone MUrray Hill 2-7970

It will TASTE better, LOOK better, SELL better with Takamine products

tion on properties and potential applications of "Freon" C-318 for use in self-dispensing, spray, and foam food specialties; including list of patents relating to aerosol food products and packaging. 16p.—E. I. duPont de Nemours & Co., Wilmington, Del. (361)

Additives. Details applications and properties of ingredients for food enrichment. 3p.—Hercules Powder Co., Wilmington, Del. (360)

Organic Compounds. Includes applications and properties of series of chlorinated biphenyls and polyphenyls ranging from oily fluids to crystalline powders. 43p. — Monsanto Chemical Co., St. Louis, Mo. (362)

Antifoamers. A guide to foam control through use of silicones. 8p. — Dow Corning Corp., Midland, Mich. (363)

MANAGEMENT

AMA Bookshelf. Complete catalog contains latest listings of reference materials that serve as basic sources of information. Includes available books, reports, studies, films, out-of-print publications and others, covering all phases of industrial management. 43p. — American Management Assn., Inc., N. Y. C. (394)

Industrial Planning Guide. Official Class B Product List and Product Assignment Directory is designed as guide from which economic, statistical, technical, and other information may be obtained for hundreds of products. Industry divisions include Food, Agriculture, and Containers & Packaging. 160p. —Superintendent of Documents, Washington, D. C. (395)

Supply Savings. Gives case history of government defense supply management and how savings are obtained. Serves as basic guide for engineers and inventory managers for increased savings through standardization and substitution of equipment and supplies. 59p. — Assistant Secty. of Defense, Washington, D. C. (396)

MARKETING

Increase Egg Profits. Tells egg marketers how to win customers and increase profits through fresh, step-by-step approach to higher profit margins. Includes up-to-date market and lab research and highlights advantages of cellophane overwrapping for egg cartons. 12p. — American Viscose Corp., Philadelphia, Pa. (390)

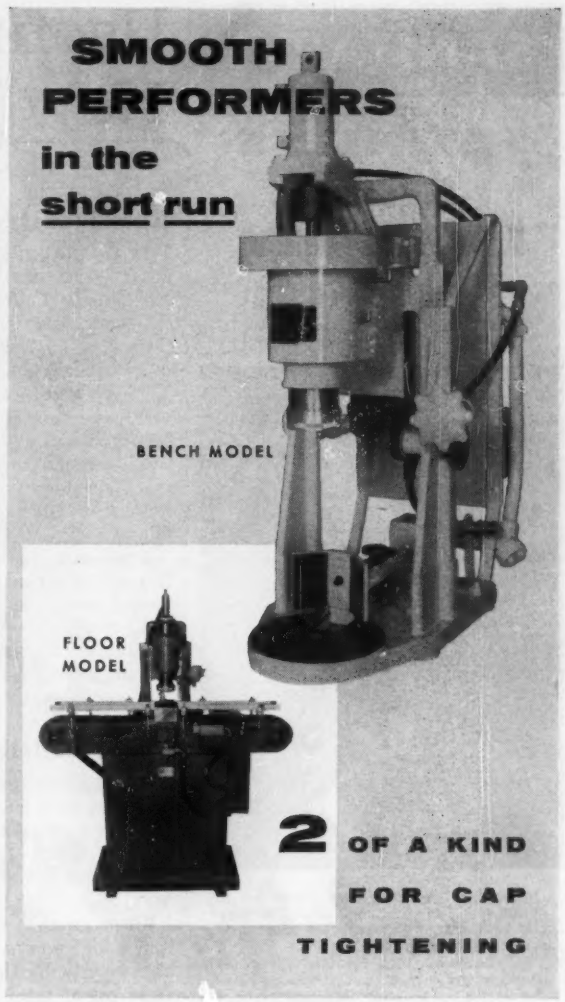
Overseas Markets. Outlines firm's service in helping clients decide whether they should manufacture, license, or sell directly in overseas markets. Describes service available for obtaining manufacturing rights for new products or processes in other countries. 8p—Porter International Co., Washington, D. C. (391)

Small Firm Advertising. Outlines problems faced by regional manufacturers in competition with national brands' advertising programs, and gives recent changes in media ad policies to aid small firms. 5p.—VanSant, Dugdale & Co., Baltimore, Md. (392)

Up Grocery Sales. "Six Ways To Do Something About Sluggish Sales" outlines ways you can use information compiled by MRCA's national consumer panel for increased sales volume. 16p. — Market Research Corp. of America, N. Y. C. (393)

Major Markets. Eighth annual analysis of nation's 300 metropolitan market areas listing data for each market on sales by food stores and eating - drinking places. Considers per capita and family expenditures, population, and households. 90p. — Greensboro News-Record, Greensboro, N. C. (397)

Consumption Report. Survey of magazine's readers shows product usage and frequency of use by age group, including form in which food item was purchased. 68p. — PARENTS' magazine, N. Y. C. (398)



Each of these Unicappers—bench or floor—requires the assist of one operator who feeds the container, with the cap loosely placed on, in position to be automatically tightened to uniform tension. The tightening chuck is driven down to contact the closure by air cylinder action. Both machines handle screw or lug type turn-on caps and container sizes up to 7" in diameter. Adjustable to height range from 2" to 10". Adjustable tension, quick, easy change-over from one size to another.

Mail the coupon and get the full facts on these two versatile low cost machines.

another SEMI-AUTOMATIC by PNEUMATIC

Pneumatic Scale Corp., Ltd., 91 Sidney Street, Cambridge 39, Mass.
Please send us complete information on Unicapper.

NAME _____ Position _____

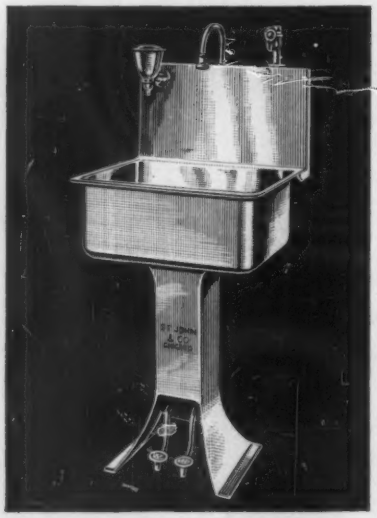
COMPANY _____

ADDRESS _____

SANITARY!

STAINLESS STEEL LAVATORY

by St. John



Designed for use wherever sanitation requirements are exceedingly high, this low-cost St. John lavatory is a remarkable achievement in every detail.

Originally intended for use in packing-houses where it meets and surpasses all requirements for federally-inspected plants, it has found wide application throughout the food industry because of its smart appearance, functional design and many practical features.

For example:

- **Extra Deep Bowl** – with smoothly rounded inside corners. Deep-drawn of type 302 stainless steel, seamless and handsomely polished.
- **Splashback** – drains into the bowl. Made of smooth, seamless stainless steel.
- **Unbreakable Soap Dispenser**—chrome plated, permanently fastened to splashback. Suitable for liquid or powdered soap.
- **Spray**—chrome plated, with aerating nozzle.
- **Foot Operated Valve**—hot and cold water separately controlled or mixed.
- **Pedestal**—heavy cast aluminum alloy, resistant to virtually all acids and alkalis.
- **Simple Installations**—attach to water lines and drain. Spray is piped from foot valve at factory.

Write for full details and the complete St. John catalog.

"Famous for Stainless"

ST. JOHN & CO.

5800 S. Damen Avenue • Chicago 36, Illinois

Phone: PRospect 8-4200

Useful New Books

Meat Industry Economics

THE CHANGING STRUCTURE OF THE MEAT ECONOMY *by Dale E. Butz and George L. Baker, Jr., Division of Research, Harvard Business School, Cambridge, Mass. 1960. 204p. Price: $3.00.*

This significant new volume selects certain changes which have occurred and will continue to occur in all segments of the livestock and meat economy, and evaluates their impact on all segments of the industry.

Problems as well as proposed courses of action are listed and discussed within the framework of an industry-wide analysis. Business organization, technology, and consumer demands are given important consideration.

Lower Distribution Costs

MANAGEMENT OF THE PHYSICAL-DISTRIBUTION FUNCTION, *American Management Assn., 1515 Broadway, NYC 36. 1960. 200p. Price: $5.25 (non-members), $3.50 (members).*

Part one of this report shows how alert companies identify and control cost by thinking and acting in terms of total distribution costs. Part two deals with common transportation mediums and how they can help cut distribution costs, improve service, and maintain quality and availability of products.

Advanced Farming

POWER TO PRODUCE. *Superintendent of Documents, Washington 25, D.C. 1960. Price: $2.25.*

The effects of the mechanical revolution on the farm and its improvement of American life dealt with in a book for everyone interested in the tremendous benefits derived from farm technology. It is the latest in the modern series of comprehensive yearbooks published by USDA since 1936.

This newest volume includes charts, drawings, and photographs depicting mechanical developments and new equipment items. Among topics covered are development of tractors, electricity, communications, power on the land, harvesting methods, developments in handling livestock, mechanization of marketing, farm buildings, efficiency of labor, the effects of power, and power in the future.

Supermarket Promotion

MANUAL OF PROMOTION AT SUPERMARKETS *by Laurence E. Korwin. New Products Council, 333 N. Michigan Ave., Chicago 1. 1960. Price: $5.00.*

A guide to creative thinking and planning of supermarket promotions, manual covers such subjects as signs, displays, color, lighting, etc.

Selection of products as well as promotional methods used on these products is covered in detail. Factors of store image are analyzed and classified, giving suggestions on how to select and vary promotion to suit store image.

Supermarket promotional devices such as sampling, demonstrations, free premiums, etc., are also considered in relation to the store image.

Booklets & Reports

CALIFORNIA ASPARAGUS: EFFECT OF TRANSIT ENVIRONMENTS ON MARKET QUALITY. *Marketing Research Report No. 428, U.S. Dept. of Agriculture, Washington, D.C. 1960.*

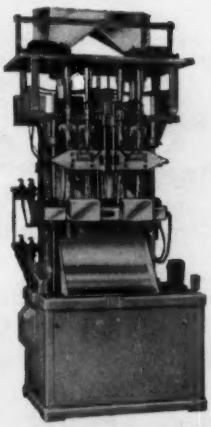
Deals with two phases of problem—(1) Temperature, Relative Humidity, and Atmosphere Composition In Rail Cars; (2) Effect of Atmosphere Composition On Quality.

CORN IN INDUSTRY, *Corn Industries Research Foundation, 1001 Connecticut Ave., N. W., Washington 6, D. C. 1960. 64p.* Describes how corn kernels are taken apart to make starch, syrup, sugar, oil, and feeds, and how these products enter into the manufacturing processes of scores of food and non-food industries.

FOREIGN COMMERCE HANDBOOK, *Foreign Commerce Dept., Chamber of Commerce of the U. S., 1615 H St., N. W., Washington 6, D. C. 1960. 155p. Price: $2.00.* Presents complete compilation of latest developments in foreign trade practices, procedures, and services.

FMC Stokeswrap dependability proved at The Nestlé Company

The Nestlé Company, world-famous chocolate producer, depends on Stokeswrap for fast, accurate, automatic operation in pouch packaging many of its products. At the Nestlé plant in Fulton, New York, for example, Stokeswrap machines package Semi-Sweet Chocolate Morsels in 12-ounce, 6-ounce and sample sizes, Butterscotch Toll House Morsels in 6-ounce size, and 5-ounce packages of Nestlé Milk, Almond and Crunch Chocolates. Stokeswrap machines are also in operation in other plants for other Nestlé products.



For the full story of proved-in-performance Stokeswrap design, write for Bulletin P-801.

Nestlé is one of a large number of well-known chocolate makers for whom Stokeswrap has proved its design and dependability in year-in, year-out performance. Models are available for pillow pouches, four-seal and strip type packages. All are formed, filled and sealed automatically, from roll stock of printed or unprinted paper, cellophane, polyethylene or other heat sealable materials . . . either single ply, double ply or laminated. Electric eye control with constant web tension assures accurate registration. Pocket feeds, auger, tablet counting, net weighing and liquid filling systems offer a high degree of accuracy for a broad group of granular, powder, liquid and semi-liquid products. Capacities range up to 1½ lbs. depending on product. For top speeds on smaller size packages, the four-tube model shown here produces up to 240 units per minute, and requires no more floor space than standard machines.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
FMC Packaging Machinery Division
Stokes & Smith Plant
4914 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

Recent Inventions

PRODUCTS

Caramel-Coated Apple with Imperforated Skin and Annular Band of Surface-Coated Caramel.—H. Pikal, Bangor, Mich. No. 2,946,689.

Dried Malt to Increase Viscosity of Fermented Beverages. — E. Komm, Munich, Germany. No. 2,947,667.

Malt Liquors Containing 2, 4, 5-Trihydroxybutyrophenone.—G. H. Kinsman, Basic Products Corp., Milwaukee. No. 2,948,616.

Nut-Flavoring Additives Made From Nut Butter That's Room-Temperature Cooled Before Addition of 70% Aqueous Sorbital—F. L. Avera, Corn Products Co., Chicago. No. 2,948,621.

Bread Dough Dusting Mix Containing Semi-Solid Particles of Saturated Edible Fats and Oils and Grain Flour.—A. C. Becker, Los Angeles. No. 2,949,365.

Cold Milk Puddings Comprising Water-Soluble-Alginate, Phosphate-Solubilizing Salt, Edible Acidic Ingredient and Milk Solids. —A. R. Hunter, Kelco Co., San Diego, Calif. No. 2,949,366.

Molded Frozen Confection Containing Thickener and Binder Selected From Group of Water-Soluble Cellulose Ethers.—F. E. Windover, The Dow Chemical Co., Midland, Mich. No. 2,950,199.

PROCESSING

Preventing Discoloration of Barrel-Packed Pickles in Salt Brine Consisting of Flavoring and Alkali, Then Heating to 140-200 F.—M. M. Scharf, Chicago. No. 2,946,690.

Curing Meat in Pickling Solution Comprising Salt and Sweetener Consisting of Cyclamic Acid, Saccharin, Cyclamates and Saccharin Salts.—L. E. Kahn, E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,946,692.

Hydrolysing Starch by Recycling Acidified Solution Through Heater and Reactor. — E. F. Boon, Werkspoor N. V., Amsterdam, Netherlands. No. 2,946,706.

Shipping Packaged Perishables in Insulated, Liquid-Tight Container Into Which Liquid Nitrogen Is Introduced. — W. L. Morrison, Liquefreeze Co., Inc., N. Y. C. No. 2,948,123.

Preventing Caking of Bulk Sugar During Storage by Mechanical Conveying System Not Involving Use of Substantial Pressure. — J. Corrigan, J. C. Corrigan Co., Inc., Dorchester, Mass. No. 2,948,424.

Hopping Brewers' Wort by Recirculating Part of High-Temperature Treated and Cooled Wort for Re-raising to High Temperature and Re-cooling.—S. W. T. Paine, The A. P. V. Co., Ltd., Crawley, England. No. 2,948,617.

Brewing Coffee by Subjecting Ground Beans to Streams of 185 to 200-F. Water and Separating Brew From Coffee Grounds.—T. R. Saint, Jabez Burns & Sons, Inc., N. Y. C. No. 2,948,618.

Steam Blanching Foods Continuously As a Portion of Condensate and Nutrients Are Collected for Distribution Over Products Later Passing Through Cooling Chamber.—C. M. Ashley, Carrier Corp., Syracuse, N. Y. No. 2,948,619.

Meat-Spoilage Indicator Comprising Two-Compartment Package With Lyophilized Microorganisms Capable of Growing at Increasing Temperature, Dried Nutrient and Indicator for Showing Growth of Organisms.—M. C. Brockmann, Hygrade Food Products Corp., Detroit, No. 2,950,202.

Quick-Freezing Raw Onions. —R. J. Groen, Santa Clara, Calif. No. 2,950,203.

Hot Water Extracting Concentrate of Ground Coffee in Atmosphere Devoid of Oxygen and Containing Gaseous Components From Incompletely Combusted Hydrocarbon Fuel. — J. W. Cameron, Vitagen Corp., Los Angeles. No. 2,950,973.

Immersing Eviscerated Poultry in Chill Water Containing Non-Pathogenic Lactic Acid Bacteria.—J. H. Silliker, Swift & Co., Chicago. No. 2,950,977.

Preparing Dry Ravioli From Dough Containing Anti-crack Material, Flattening Dough Into Two Strips With Dried Filling Sealed Between Formed Envelope.—V. Milani, Silver Springs, Md. No. 2,950,978.

Gelatinizing Raw Cereals With Enzymes.—A. L. Nugey, Rahway, N. J. No. 2,951,762.

PACKAGING

Tray Packing and Forming Machine that Handles Tray Blanks.—W. B. Fahrenbach, Burgermeister Brewing Corp., San Francisco. No. 2,932,929.

Fluid Dispensing Package Comprising Inner Flexible and Sealed Container with Hollow, Triangular Pouring Flap. — D. Bensel, N. Y. C. No. 2,933,229.

Gas-Filling Device for Treating Filled Packages. —A. Graefingholt, Stuttgart-Bad Cannstatt, Germany. No. 2,933,868.

Packaging Fluid Product in Bags of Prefabricated String of Plastic Material. —G. Bardet, Paris, France. No. 2,934,868.

Packaging Machine with Product-Detecting Mechanism.—H. E. Engleson, F. B. Redington Co., Bellwood, Ill. No. 2,934,869.

Inserting and Sealing Unit Within Mouth of Container. —R. T. Wise, Drumstick, Inc., Columbus, O. No. 2,934,872.

Unloader that Automatically Removes Jars from Cartons. — T. E. Rose, Beech-Nut Life Savers, Inc., Canajoharie, N. Y. No. 2,935,215.

EQUIPMENT

Peach Half Pitter Comprising Movable Peach and Pit Holders.—E. R. Anderson, Filper Corp., Richmond, Calif. No. 2,943,659.

Poultry Picking Device Comprising Support With Inclined Shield and Picking Cylinder. — F. C. Corey, Pickwick Co., Cedar Rapids, Ia. No. 2,945,257.

Refrigerated Milk Storage Tank with Cooling Coils, Compressor, LP Gas Engine and Control Circuit.—M. P. Schultz, U. S. Industries, Inc., N. Y. C. No. 2,945,356.

Citrus Fruit-Juice Extractor Having a Pair of Horizontally Spaced Rollers With Matching Fruit-Receiving Cavities, Cutting Blade and Conical Disks to Provide Squeezing Action. — R. D. Wehr, Lakeland, Fla. No. 2,945,431.

Vegetable Cleaner and Separator of the Water-Using Type—G. J. Olney, Westernville, N. Y. No. 2,945,589.

Dough Mixer and Kneader With Shaft Containing Upper and Lower Paddle Blades.—I. B. Clifford, N. Y. C. No. 2,946,299.

Fruit Orienting, Transferring, Splitting and Pitting Machine.—H. A. Skog, Canning Equipment Co., Olympia, Wash. No. 2,946,361.

Pressure Liquid Filter for Beverage Industries. — A. Welz, Filtrox-Werke A. G., St. Gallen, Switzerland. No. 2,946,447.

Wafer Sandwich Unit Comprising Spreader, Conveyor for Feeding Wafer Sheets and Sandwiching Machine. —K. Farrer, Baker Perkins Ltd., Peterborough, England. No. 2,947,266.

Corrugated Potato Chip Machine. — H. Schachet, Denver, Colo. No. 2,947,335.

Horizontal, Perforated Malting Drum. — A. R. Graff, Columbia Malting Co., Chicago. No. 2,947,669.

CIRCLE 123 ON READER SERVICE CARD →

Now! TART gelled sauces!

Make them with the only pectin that gells without sugar

Imagine—a tangy gelled fruit sauce! Many new, and saleable gelled food products are made possible by EXCHANGE LOW METHOXYL PECTIN—the *only* pectin that forms a true gel without the need for sugar.

With L. M. Pectin you can produce a full line of gelled foods of any degree of sweetness—even sugar-free for diabetics and low-calorie dieters. Use it for aspics, relishes, low-calorie jams, fruit jells and desserts. They'll stay firm at room temperature, yet be tender, elastic and sparkingly brilliant.

Get full information—including technical data and formulas. Call your Sunkist man or mail the coupon today.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

Gentlemen: Please send data on use of Exchange Low Methoxyl Pectin in ( ) low-calorie jams ( ) aspics ( ) fruit jells ( ) relishes ( ) desserts ( ) sauces ( ) other.

NAME _____

ADDRESS _____

CITY _____ ZONE _____

STATE _____

Exchange

CLASSIFIED ADVERTISING

EMPLOYMENT EQUIPMENT—USED or RESALE SERVICES

STAINLESS STEEL TANKS

(all Sanitary polished)

1—5,000 gal. 9' dia. x 10'6" deep.
1—1,600 gal. 7'10" dia. x 5'2" deep.
2—750 gal. 5' dia. x 5'6" deep.
1—650 gal. 5' dia. x 4'6" deep.
1—500 gal. 4'6" dia. x 4'6" deep.
1—3,000 gal. 6' dia. x 29' lg. Insulated.
1—1,250 gal. 6' dia. x 6'6" dp. Insulated.
1—3,000 gal. 8' dia. x 15' dp. with coils, for VACUUM.
5—TRUCK TANKS: 1,350 to 2,800 GAL. Single and double compartments.

SPECIALS

4—Buflovac DOUBLE EFFECT EVAPORATORS, (606-708-840-1025 sq. ft. each) with condensers, pumps, supports, etc. Stainless Steel Sanitary.
2—CENTRIFUGES: 40" and 26" steel perforated suspended Tolhurst.
10—S.S. sanitary HEAT EXCHANGERS, shell and tube, 50 to 250 sq. ft.
2—VACUUM PANS: 5' and 8' dia. with coils, all S.S. sanitary.
6—DOUBLE DRUM DRYERS 42" x 120", 42" x 90", 32" x 120", 24" x 36".
3—HOMOGENIZERS: 600 and 700 G.P.H. 2 stage Manton-Gaulin; 1000 G.P.H. Cherry-Burrell all stainless heads.
1—HIGH TEMP. SHORT TIME PASTEURIZER, 20,000#/hr. Cherry-Burrell, S. S. Plates.
1—PLATE EXCHANGER, Cherry-Burrell, 36 in 3 sections. All stainless Model SAS-75.
1—PLATE EXCHANGER, Cherry-Burrell, 36 stainless Plates in two sections. Model C-24.
1—PLATE EXCHANGER, Creamery-Package, 88 stainless plates in 3 sections.

BEST EQUIPMENT COMPANY, INC.
1237 W. HOWARD ST. CHICAGO 26, ILL.
AMbassador 2-1452

IN STOCK AT LOEB'S . . .

Cappers: Resina, Pneumatic Scale Swansen, Capem.
Centrifuge: Tolhurst 48" st. steel suspended.
Centrifuge: AT&M 60" st. steel centerslung.
Column: Struthers-Wells 24" st. steel x 22'.
Disintegrators: Rietz RD18-P 75 hp., RD-12 15 hp.
Disperser-Homogenizer: Tri-Homo #10, 30 hp.
Dryers: Devine 2 x 4 vac. drum st. steel
Dryer: Devine #7 13-shelves 60" x 7'
Dryer: Bowen lab. spray, st. steel.
Dryer: American double drum 24 x 48".
Dryer: Procter & Schwartz st. st. 6-tray.
Evaporator: Buflovak st. st. 94 sq. ft.
Filler: Mojonnier #90, 14 head, st. st.
Fillers: liquid vacuum, siphon, gravity.
Fillers: Stokes, Colton, Elgin, Geyer, M&S.
Fillers: powder Speedee, Triangle, Stokes & Smith.
Filler: Pfaudler King 9-spout rotary st. steel.
Filter Press: Shriver st. st. 24" 17-chambers.
Filters: Int. pressure—Alsop, Spargler, Lemax.
Glues, carton: Stand.-Knapp, Ferguson, Triangle.
Homogenizers: 25, 60, 125, 1200 GPH
Kettles: Stain. Steel with or without agitators.
Labelers: Burt, Standard-Knapp, N. J. Penn Labelrites, Pneumatic Scales duplex.
Mills, hammer: Mikro, Gump, Prater, Raymond JayBee, Jeffrey, Williams, Fitzpatrick.
Enterprise vertical 15 hp.
Mixers, dough type: single and double arm.
Buffalo 1000 lb. vacuum over 10 hp.
Glen Power Plus 340 qt 5 hp.
Powder: 50 to 2000 lb. capacity.
Packager: Transwrap model B.
Pellet Mill: Sprout Waldron mod. 501B, 75 hp.
Plate Cooler: CB st. steel 24 sq. ft.
Pumps: Centrifugal, rotary, gear vacuum.
Pulper: FMC MC-004, 30 hp.
Retorts: 40 x 72" vertical with controls.
Riving Meh: Fitzpatrick model 8 st. steel.
Sealers, case: A-B-C model L jr.
Sealer: Case model A2001-18.
Tablet Presses: Stokes DD2 23 station.
Tanks: Stain. steel 25 gal. to 1200 gal.
Tank: Pfaudler 2500 gal. glass lined.
Votator: 1-cylinder, st. st. roll 3½" x 44"
Vacuum Pans: St. steel Rogers 6', Harris 42".

Send us your inquiries and list of idle equipment

LOEB EQUIPMENT SUPPLY CO.
• TELEPHONE SEeley 8-1431
820 WEST SUPERIOR ST. CHICAGO 22, ILLINOIS

BEST BUY

SAVE $4000
M & S STAINLESS FILLER

10 Piston unit presently set for 6 oz can. Stainless contact, excellent condition. Arranged for seamer drive.

In Our Stock

Wire or phone collect—GA 1-1380

ME MACHINERY AND EQUIPMENT CO.
123 Townsend St. • San Francisco 7, Calif.

FOR SALE

Hayssen Model 5-8 Automatic Wrapper
Model MPUB-15 Miller Wrapper
Model MPUB-17 Miller Wrapper & Sheeter
20-gal. Stainless Steam Jacket Kettle with 1½" outlet for 100-lb. WSP.
300-gal. Copper Still with Condenser and Tank.
100-gal. Read Jacketed Double Armed Dough Mixer.

SAVAGE BROS. CO.
2638 Gladys Ave. Chicago 12, Ill.

MODERN PACKAGING EQUIPMENT

SAVINGS: 50% AND MORE

• *JUST RECEIVED* •

Standard-Knapp Model 429 Top and Bottom Case Sealers with Compression Units
Package Machinery FA4 Wrapper with Electric Eye and Refrigerater coolin, unit. Also, model DF

PNEUMATIC SCALE CO. Medium Double Package Makers
PNEUMATIC SCALE CO. Heat Seal Tea Bag Machine with Taggers.
PNEUMATIC SCALE CO. High Speed Cartoning Lines—Feeders, Bottom Sealers, Rotary Filters & Top Sealers.
PNEUMATIC SCALE CO. Synchronized Liquid Filling Line consisting of: Invert type Air Cleaner, 20 Spout Stainless Steel Filler, 4 Head Rotary Capper, Duplex Labeler.
PNEUMATIC SCALE COFFEE BAGGING COMBINATION—forms double wall bag, fills 1 lb. coffee, Tin-Tie Closure.
CECO MODEL 40 Adjustable Cartoner with Automatic Carton Feeder. Also 5801.
RESINA RU 120 CAPEM, PNEUMATIC: 1, 3 and 4 Head Cappers.
PACKAGE MACHINERY. Hayssen and Seandia Wrappers with Electric Eye.
KARL KIEFER, 24 Spout Stainless Steel Rotary Vacuum Filler, synchronized to Karl Kiefer Bottoms-Up Rotary Bottle Cleaner.
BATTLE CREEK, Model #40, Wrapping Machine, equipped with Oliver Heat Seal Label Attachment.
TRANSWRAPS, Models A, B and C—with Electric Eye.

Partial List—Send for complete list of equipment in stock

TOP PRICES FOR SURPLUS PACKAGING EQUIPMENT

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone: Yonkers 5-0442

HEADLINERS

1—Buflovak 6" x 8" vac. drum dryer.
3—Fitz. comminuting machines: #M,D,F
2—5700 gal. T304 SS. horiz. tanks—UNUSED.
2—4500 gal. T304 SS. vert. tanks—UNUSED.
1—Mojonnier 1550 sq. ft. triple effect evap., st. st., sanitary, with preheaters.
1—Bowen lab. spray dryer, T304 SS.
2—Mikro #3TH pulv., stirrup hammers.
1—York Freon 12 comp., 6¾ x 5, 40 HP.
3—Sharples #16-NF st. st. centrif., no-foam.
10—Sharples #AS-16V inconel centrif., 3 HP.
1—Tolhurst 48" T304 SS susp. centrifugal.
6—A.T.&M. 40" T304 SS susp. basket centrif.
12—Buflovak 42" x 120" double drum dryers.
1—Niagara #53-36, 54 sq. ft. T304 SS filter.
2—Davenport #1A dewatering presses.
6—Davenport #2A dewatering presses.
1—Buflovak 5' x 12' drum dryer—VAC—UNUSED
1—Link-Belt 3' x 8' T304 SS screen.
6—Stainless vacuum tanks with coils: 3700, 3000, 2800, 2000, 1750, 1250 gal.
1—Resina auto. single head copper.
60—Baker Perkins size #17, 200 gal. dbl. arm jacketed mixers.
3—Sharples #C-20 Super-D-Hydrators, T316 SS.

PERRY EQUIPMENT CORP.
1411 N. SIXTH ST.
PHILADELPHIA 22, PA.
POplar 3-3505

A BRILL BUY . . . IS THE BEST BUY

SPECIALS

2—Louisville 8' x 50' Hot Air Rotary Dryers, 304 SS.
3—Louisville Rotary Steam Tube Dryers, 5' x 45', 6' x 35', 6' x 50'.
3—Buflovak 42" x 120" Double Drum Dryers, SS Accessories.
2—Fletcher 48" Suspended 316 SS Perforated Basket Centrifugals.
1—Bird 18" x 28" 304 SS Solid Bowl Continuous Centrifuge.
1—Model D Fitz Mill, 7½ HP motor.
4—1000 gal. 304 SS Tanks, 5' 6" x 6'.
1—No. 5 Sweetland Filter, 304 SS, 120 sq. ft.
1—Devine Vacuum Shelf Dryer, 10—40" x 434" shelves.
1—Abbe 1000# Aluminum Powder Mixer, 7½ HP motor.
5—Day Robail Sifters, 40" x 120", 40" x 84" Double Deck.

BRILL EQUIPMENT COMPANY
35-37 Jabez St., Newark 5, N. J.
OR
4101 San Jacinto, Houston 4, Texas

MODERN REBUILT MACHINERY

UNION Rebuilt Machinery

At Great Savings

Package Machinery Models FFH, FF, FA, FA-2, FA-3, FA-4 Wrappers. With and without Electric Eyes and Labeling Attachments.
Hayssen, Oliver, Package Machinery, Battle Creek, Hudson Sharp and Miller Wrappers—all sizes.
Pneumatic Scale High Speed Automatic Cartoning Lines, with and without Liners. Tite Wrap.
Fitzpatrick Models D, D0, K, S.S. Comminuters.
Mikro Models 1SH, 2TH, 3TH, 4TH Pulverizers.
Transwrap Model A with Volumetric Feed.
Standard Knapp, A-B-C, Ferguson Carton Sealers.
Coco Models 45, 40 and 390i Carton Sealers.
Baker Perkins, Day, W. & P. Heavy Duty Jacketed Mixers, 5 to 150 gal.
Day Dry Powder Mixers, 25 to 2000 lbs. caps.
Groen 100 gal. Jacketed Mixing Kettle.
Stainless Steel Jacketed Kettles 50, 100, 150, 350 gal. caps.
Mixers, Labelers, Fillers, Sifters, Grinders, Pulverizers, all makes, sizes and capacities.

Complete Details and Prices on Request

UNION STANDARD EQUIPMENT CO.

318-322 Lafayette St.
New York 12, N. Y.
CAnal 6-5333-4-5-6

167 No. May Street
Chicago 7, Illinois
SEely 3-7845

LATE MODEL PACKAGE MACHINERY

FILLER MACHINE 4 SPOUT SS FILLER
TRANSWRAP Models A & B.
Package Machinery, Models FA., FA2. F10J Bundler also Hayssen, Scandia.
Resina Capper, High Speed and Single.
Pneumatic Straight Line 20 Head Filler.
Pneumatic, Pony, World Labelers.
Horix, Karl Kelfer, Ertel Fillers.
Pneumatic Scale High Speed Cartoning Line (also 30 CPM).
Standard Knapp #429 Case Sealers.
Standard Knapp High Speed Can Labelers.

PRECISION REBUILT and GUARANTEED

RPM INC.

43 - 34TH STREET
BROOKLYN 32, NEW YORK
STerling 8-1550

ECONOMICAL EQUIPMENT READY for IMMEDIATE USE

Stainless Kettles, Tanks, Vacuum Pans, Stills, Reactors Colloid Mills, Homogenizers, Viscolizers, Comminutators. Abbe, Ball & Jewell Rot. Cutters. Fillers for Liquids, Pastes, Powders, Crystals, Semi-Liquids. Cappers, Labelers, Casers, Sealers. Dryers, Crystallizers, Evaporators.

Send for Complete List

FIRST MACHINERY CORP.

209-289 Tenth St., Bklyn. 15, N. Y.
Phone ST. 8-4672—Cable "Effemcy"

BARGAINS FOR SALE

The Ruderman Machinery Exchange of Gouverneur, N. Y., one of the largest diversified Machinery & Equipment Dealers in America, can furnish you with practically all your needs in Modern Ice Cream, Milk Plant and Electrical Equipment at but a fraction of the original cost.

WRITE—WIRE—PHONE FOR YOUR NEEDS

RUDERMAN MACHINERY EXCHANGE

Gouverneur, New York Telephone 333-334

VALUES GALORE!

1—Elgin Dual Piston Filler, 32 to 64 ozs.
2—Elgin & Haskins Semi-Automatic Cappers.
2—Stainless Steel Washing & Cooling Conveyors, 15' and 40' w/7" S.S. Mesh Chain.
1—N. J. MX Pony Labeler.
1—Day Stainless 50 Gal. Sigma Blade Mixer.
1—Cyclotherm Package Boiler 20 H.P.
1—S & S Model G-1 Stainless Steel Auger Filler.
1—Triangle Carton Gluer & Sealer.
6—Stainless Jack. Kettles 50-300 Gals.
4—Hercules 8" & 16" Sq. Type 316 Stainless Steel Filters.
Benders, Agitators, Conveyors, Tanks, etc.

WRITE FOR BULLETIN A-45

THE MACHINERY & EQUIPMENT CO.

91-93 New Jersey Railroad Avenue
Newark 5, N. J. MArket 2-3103

SPECIAL OFFERINGS

42 x 90 Buflovak Drum Dryer
York Water Coolers, 4 & 6 S.S. Wings
100 to 600 gal. S.S. Water Jacketed Tanks
1000 to 3400 gal. S.S. Insul. Tanks
300 gal. S.S. Tanks, top agitator
S.S. Plate & Cabinet Type Heat Exchangers
1½" x 2" Waukesha Pumps
40 and 60 H.P. Cleaver Brooks Boilers
3 x 3, 5 x 5 and 6 x 6 Ammonia Compressors
125 to 1500 gal. S.S. Homogenizers
80 qt. 2 H.P. Hobart Mixer
Milk Bottle Washers & Fillers
#75 & #176 Canco Container Fillers
40 to 300 gal. Continuous Ice Cream Freezers
20' Coal Conveyor

SEND US YOUR INQUIRIES

LESTER KEHOE MACHINERY CORP.

2581 Richmond Terrace Staten Island 3, N. Y.
Gibraltar 7-3410

SPECIAL OFFERS

CENTRIFUGE: Sharples Super Decanter, all S/S Model PN 14.
MIXERS: Grede & Gray 4,000# horiz. ribbon blender; Hobard Mixanette lab. mixer; Buffalo Mod 4A 1,000# meat mixer; J. H. Day units from 25 gal. to 900 gal.; Howe 810 gal.
MILLS: Prater Pulverizer size 009; Prater hammermill size 30; Fitzpatrick Mod. D. Mikro Mod. 2 TH.
FILLERS: Triangle Elec Tri Pac Model G2; M & S 6 and 12 pocket; FMC 4 spout piston filler.
KETTLES: 20 gal. to 300 gal; some S/S, some S/S clad; 40 to 80 gal. gas fired kettles.
MEAT PACKING & RENDERING: Anco 5 x 9 and 5 x 12 cookers; Mitts & Merrill CD and CRE hogs; Globe 200 and 300# stuffers; Anco & Buffalo grinders.
PACKAGING: Oliver 799 M; Hayssen 3-7 and 8-11 wrappers; ABC Model A and Mod X8SA; Elliott and Standard Knapp case sealers.
FILTERS: Sparkler Model 33 D-7; Sparkler Model 14-4; Niagara style H horizontal filter.

List your idle machinery.
Send for our catalog No. 160

Write—Wire—Phone

AARON EQUIPMENT CO.

9370 Byron Street
Schiller Park, Illinois
GLadstone 1-1500

PUZZLED . . .

about personnel problems

Dissatisfied with present recruiting methods? FOOD Engineering's Employment Advertising section is the meeting place for employers and men qualified to fill positions in food manufacturing plants. For advertising rate, write to Chestnut and 50th Sts., Phila. 39.

For Sale: Racine S-1 sucker machine and complete equipment for manufacture of suckers, including sizer, 5-ft. web removing drum, cooling chamber with compressor and conveyor. This equipment used for limited research. In new condition. Will sacrifice.

BOX FE-22
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

STAINLESS STEEL VALVES AND FITTINGS

For Milking Parlors and the Milk Industry. Descriptive Leaflet and prices on application. Agencies still open in most countries. Write to

NECHUSHTAN LTD.

P.O.B. 1758, TEL AVIV, ISRAEL

DEC. SPECIALS

Hopa 6 piston SS Filler, type 19 #293-53
F.M.C. 12 pocket SS Can Filler #120 MC160
Package Machinery FA Wrapper
Pneumatic Scale Front & Back Labeler
Standard-Knapp Can Labelers, all sizes
King Pfaudler SS 9 pocket Filler for #10
U. S. Rotary NA22 spt.SS Vacuum Filler #592
Transwrap model A Packaging machine
World Twin Turret Labeler #C10006, 120 pm

WE BUY COMPLETE PLANTS OR SINGLE UNITS

EQUIPMENT CLEARING HOUSE, INC.

111 33rd Street, Brooklyn 32, N. Y.
SOuth 8-4451—4452—8782

OUTSTANDING VALUES!

Case emulsifier SS 10 HP
Lee SS 150 gallon double motion jacketed kettle
Dixie SS 8 gallon jacketed kettle
Lee SS 300 gallon jacketed kettle

CHEMICAL & PROCESS MACHINERY CORP.
51-52 9th St., Brooklyn 15, N. Y. HY 9-7200

Wanted

WANTED

Large quantities of glass jars, capacity 3 ozs. to 25 ozs. any finish except C. T. Prices must be about 50% under list. Quantities 5000 cases or more per item.

FRUITCREST CORP.

109 So. 6 St., Brooklyn 11, N. Y.

Employment

HELP WANTED

TWO OPPORTUNITIES FOR CHEMISTS

Rapid growth in volume has created two exceptional openings for young Organic Chemists on a fine laboratory team in one of the country's leading producers of pure food colors.

1. One position will entail the responsibility of process development and production control methods.
2. The other position will concern experimental work in customer product application procedures.

The scope for creative research is virtually unrestricted in both positions.

Ages should be about 23 to 35. Master's degree is preferred but not essential if scholastic record is outstanding. Applicants must possess ability to work with minimum supervision but be compatible with group of independent thinkers.

Remuneration ample to interest men of highest calibre. Confidence guaranteed to all inquirers.

Mr. John McCormack
Warner-Jenkinson Mfg. Co.
2526 Baldwin St. • St. Louis 6, Mo.

FOOD CHEMISTS (3)

An expanding food processing company, located in Northern New Jersey, has immediate opportunities in the quality control section of its Research Dept. for graduate chemists with MS or BS degree.

Major duties include chemical and physical testing of noodles, soup mixes, salad dressings and raw materials. Experience in these products, using standard methods (A.O.A.C., A.O.C.S. or A.A.O.C.C.) and ability to intrepret results is desirable. 3 to 5 years' experience.

Salary commensurate with qualifications and experience. Liberal fringe benefits; 35-hour week.

Send resume, stating age, qualifications and salary desired.

BOX FE-39
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

PROCESS ENGINEER

For rapidly expanding company specializing in high quality food products.

Successful candidate should have record of achievement in the design and development of plant and equipment, and preferably have first-hand experience in developing automated processes in the baking industry.

Professional qualifications are essential, preferably a degree in mechanical engineering. Experience in combining electrical and general machine design would be a strong recommendation, as would solid knowledge of refrigeration, thermodynamics, hydraulics, and packaging equipment.

Excellent salary and benefits. Modern air-conditioned plant. Please send full resume including salary information in confidence to **Robert James, Director of Personnel:**

KITCHENS OF SARA LEE
5353 North Elston Avenue
Chicago 30, Illinois

PLANT SUPERINTENDENT

For million case food plant in New York State. College degree preferred.

BOX FE-31
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

CHEMIST with a B.S. degree, with a background in the use of essential oils and oleoresins. This is not a run-of-mill opportunity. It is first class in every respect and has a continuing challenge for a live-wire who is able to help analyze, duplicate and develop flavoring for the meat processors. We have all the standard forms of security such as pension, bonus, periodic increases, etc., etc. Our plant is located in the midwest and we are one of the large companies in our industry. Working facilities and surroundings are excellent. Salary commensurate with ability and background. All replies will be held in strictest confidence.

BOX FE-37
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

WANTED

Quality Control Manager Trainee for frozen bakery product company with national distribution. Relocation probable. Personnel policies excellent. Experience in bacteriology, chemistry, dairy, egg and dairy products desirable. Indicate salary requirements and send resume to

BOX FE-38
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

DESIGN ENGINEERS

Expanding operations by a leading manufacturer of quality dairy, food and beverage machinery has created several attractive design assignments. Requisites: M.E. or E.E. degree, and experience in one of the following areas—machine design, materials handling machinery, liquid package filler, heat exchanger design and electro-mechanical design. Submit resume to Industrial Relations Manager.

CHERRY-BURRELL CORP.
2400 9th St. S.W. Cedar Rapids, Iowa

SITUATION WANTED

Man experienced all phases production desires Plant Manager or Production Management position. Age 41.

BOX FE-40
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

Professional Services

SCHWARZ LABORATORIES, Inc.

Consultation on Food Problems
Analyses of Foods and Beverages
Food Plant Design and Process Improvement
Research and Investigations
Legal Testimony
Write for bulletin describing facilities and services
230 Washington St., Mount Vernon, N. Y.
Phone: MO 4-1100 Cable: Swoknip

FOOD DEVELOPMENT LABORATORY

S. W. ARENSON, *Director*

Ingredient evaluation • New Products development
Specializing in flour shortenings, milk and other basic ingredients • • Facilities, chemicals and physical laboratory, bakery, spray dryer and other unit process equipment.

5140 Reisterstown Road, Baltimore 15, Maryland
57-01 32nd Avenue, Woodside, L. I. 77, New York

LEWIN ASSOCIATES

Consultants

PLANT DESIGN AND LAYOUT—PROCESSING EQUIPMENT—PRODUCT AND PACKAGE DEVELOPMENT AND IMPROVEMENT — WAREHOUSING — DISTRIBUTION — MARKETING
RESEARCH—ESTIMATES—REPORTS
1755 Broadway, New York 19, N. Y.
JUdson 6-1748-9

FOSTER D. SNELL

Research Laboratories

SENSORY PANEL TESTS
Food Analysis, Stability Studies, Evaluations, Packaging Problems, Vitamin Assays
Write For "Food Facts"
29 W. 15th St., N. Y. 11 WAtkins 4-8800

BIOLOGICAL RESEARCH and APPLIED CHEMISTRY

• Pharmacology • Toxicology • Microbiology
• Biochemistry • Screening • Organic Synthesis • Analytical Chemistry
• Clinical Studies • Consulting

for information write
HAZLETON LABORATORIES, INC.
P.O. Box 30, Falls Church, Va.
(in Suburban Washington, D.C.)

Ingredients for The Food Processor

STRASBURGER & SIEGEL, INC.

Chemists—Bacteriologists—Food Technologists
Specialists in Canned and Glassed Foods
Laboratory Services
Testing Tomato Products, Mayonnaise, Pickles, Oils, Fats, Beverages, Sugars, Filth in Foods, Food and Drug Labels, Expert Testimony
1400 Eutaw Place Baltimore 17, Maryland

CHAS. T. MAIN, INC.

ENGINEERING REPORTS
DESIGN
CONSTRUCTION MANAGEMENT
Consulting Engineers
Boston, Mass. Charlotte, North Carolina

Carrot Oil Makes Food Golden Yellow

Like butter, carrot oil contains natural carotene—not synthetic. Used for vitaminizing food products where a yellow color is desired. No fishy odor or taste. Send for catalog and sample.

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., So. Whitley, Ind. Phone 100

ADVERTISERS IN THIS ISSUE

This index is published as a convenience. No liability is assumed for errors or omissions.

Aaron Equipment Co. 125
Allied Chemical Corp. General Chemical Div. 65
Allied Equipment Co. 124
Aluminum Co. of America 99

Best Equipment Co. 124
Bliss Co., E. W. 4
Brill Equipment Co. 124
Bristol Co., The 113
Buffalo Meter Co., Inc. 40

Chas. T. Main, Inc. 126
Chemical & Process Machinery Corp. 125
Cherry-Burrell Corp. 14-15, 126
Clinton Corn Processing Co. 106
Corn Products Sales Co. Corn Products Div. 95

Detecto Scale, Inc. 127
Diamond Alkali Co. 127
Distillation Products Industries Div. of Eastman Kodak Co. 8, 96
Dodge Mfg. Co. 109
Dow Chemical Co. 72, 101
Dow Corning Corp. 52

Ekco-Alcoa Containers Inc. 114
Equipment Clearing House, Inc. 125
Exact Weight Scale Co., The 54

FMC Packaging Machinery Div. Stokes & Smith Plant 121
Filpaco Industries The Filter Paper Co. 110
Firmenich Inc. 89
First Machinery Corp. 125
Food Development Laboratory 126
Food Machinery & Chemical Corp. Canning Machinery Div. 6
Foster D. Snell 126
Frick Co. 81
Fruitcrest Corp. 125
Fuller Co., Subsidiary of General American Transportation Corp. 90

G & H Products Corp. 112
Girdler Process Equipment Division of Chemetron Corp. 10-11
Grinnell Co. 128

Hayssen Mfg. Co. 108
Hazelton Laboratories 126
Heil Co., The 92
Hercules Powder Co. 16, 111
Hoffman-La Roche Inc. Fine Chemical Div. 19-20

Ilies Co., A. E. 92
International Flavors & Fragrances Inc. ..... Back Cover

Jefferson Chemical Co., Inc. 78
Jenkins Bros. 50

Kehoe Machinery Corp., Lester 125
Keico Co. 76
Kimberly-Clark Corp. ..... Second Cover

Ladish Co., Tri-Clover Div. 82-83
La Porte Mat & Mfg. Co. 41
Lassiter Corp., Permoglass Div. 117
Lewin Associates 126
Link-Belt Co. 12
Loeb Equipment Supply Co. 124

Machinery & Equipment Co. 124
Machinery & Equipment Co. Used Div. Haring Equipment Corp. 125
Mack Truck, Inc. 79
Maison Frederic Fouche Food Machinery Dept. 66
Meyer Machine Co. 88
Miles Chemical Co. Div. of Miles Laboratories, Inc. 118

Nash Engineering Co. 56
Nechushtan Ltd. 125
Niagara Blower Co. 98
Nichols Engineering & Research Corp., Nerco-Niro Spray Dryer Div. 5
Norda ..... Third Cover
Nutritional Research Associates 126

Olin Mathieson Packaging Div. 53
Olofsson Corp. Weighing Div. 107
Owens-Illinois 93

Paterson Parchment Paper Co. 22
Perry Equipment Corp. 124
Pfaudler Permutit Inc. Pfaudler Div. 100
Pfizer & Co., Inc., Chas. Chemical Sales Div. 23
Pneumatic Scale Corp., Ltd. 119

R P M, Inc. 125
Red Star Yeast & Products Co. 69
Refined Syrups & Sugars, Inc. 55
Resina Automatic Machinery Co., Inc. 88
Rheem Manufacturing Co. 104-105
Riegel Paper Corp. 27
Robertshaw-Fulton Controls Co. Fulton Sylphon Div. 17
Ruderman Machinery Exchange 125

St. John & Co. 120
Sara Lee, Kitchens of 126
Sarco Co., Inc. 30
Savage Brothers Co. 124
Schwarz Laboratories, Inc. 126
Sheffield Chemical, Div. of National Dairy Products Co. 116
Speas Co. 115
Sprout-Waldron 102
Standard Oil Co. (Indiana) 18
Sterling, Fleischman Co. 115
Strahman Valves, Inc. 91
Strasburger & Siegel, Inc. 126
Sunkist Growers 123
Surface Combustion Div. of Midland Ross Corp. 26

Taylor Instruments Companies 28
Triangle Package Machinery Co. 86

Union Standard Equipment Co. 125
United States Plywood Corp. 75
Urschel Laboratories, Inc. 38

Vapor Heating Corp. 71
Vico Products Co. 85

Warner-Jenkinson Mfg. Co. 126
Webb & Co., Inc., R. D. 103
Werner Machinery Co. 94
West Carrollton Parchment Co. 9
Weyerhaeuser Co., Boxboard & Folding Carton Div. 44-45

This is how you read 1 oz. on ordinary scales

This is how you read 1 oz. ON DETECTO OVER-UNDER SCALES

Big 'travel' magnifies slightest weight discrepancy . . . prevents your profits dribbling away, ounce by ounce. Send for specifications.

DETECTO SCALES INC.
G-2 540 Park Ave., Brooklyn 5, N. Y.
CIRCLE 137 ON READER SERVICE CARD

DIAMOND CALCIUM CARBONATE

USP

Ask for quotations on this top-quality, low-priced, U.S.P. dense grade by one of the world's leading producers of calcium carbonates.

Shipped in 50-lb. bags from conveniently located warehouse stocks. Call or write today. Diamond Alkali Company, Union Commerce Building, Cleveland 14, Ohio. Sales offices in principal cities.

Diamond Chemicals
CIRCLE 127 ON READER SERVICE CARD

Grinnell-Saunders Food and Beverage Valves on syrup at approximately 5 lbs psig at 7-UP Bottling Company, Dallas, Texas. Valves operate an average of 5 times daily. Capacity of plant is 575 bottles per minute.

7up Dallas plant reports:

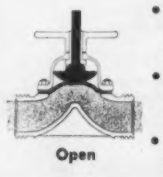
No leaks, no sticky valves, no diaphragm changes for two years with Grinnell-Saunders Diaphragm Valves

Prior to the installation of Grinnell-Saunders Food and Beverage Valves at the 7-UP Bottling Company plant in Dallas, plug cock valves were used. Following approximately 3 months' service, these former valves began to leak — eventually necessitating expensive regrinding to improve the situation.

Since installing Grinnell-Saunders Diaphragm Valves two years ago, there have been no leaks, sticking, or need for costly regrinding. There have been no diaphragm replacements, either. This — plus the fact that the original plug cocks cost almost twice as much as the Grinnell valves — is why this 7-UP plant decided to standardize on Grinnell-Saunders Valves *throughout!*

Grinnell-Saunders Food and Beverage Valves are normally furnished with stainless steel bodies, white enameled bonnets, and with diaphragms of synthetic white rubber, which impart no taste or color — and which are undamaged by cleaning solutions. Other body, lining and diaphragm materials available to meet a variety of service conditions.

For further facts, write Grinnell Company, Providence 1, Rhode Island.



- Diaphragm lifts high for streamline flow in either direction
- Diaphragm presses tightly to effect positive closure
- No packing glands to need attention
- Diaphragm easily replaced without removing valve body from the line
- Wide choice of body, lining and diaphragm materials

GRINNELL

Pipe, Fittings, Valves, Hangers, Heating and Piping Supplies • Branch Warehouses and Distributors from Coast to Coast

Reader Service

FOR MORE INFORMATION AND LITERATURE CIRCLE NUMBERS, WRITE NAME AND ADDRESS, AND MAIL!

— New Quick Response —

No postage needed. A number is keyed to every news item in **New Equipment and Supplies, Just off the Press,** and **New Packages and Products.** Most advertisements also carry key numbers. Want to know more about the company or product? Just circle the right number here and mail the card.

SPECIAL LISTING OF LITERATURE OFFERED BY OUR ADVERTISERS

Materials Handling

Materials Handling Equipment. Book 2989. Link-Belt. —12

Conveyor Belts. Literature. La Porte Mat & Mfg. Co. —41

Fillers. Information. Pfaudler Permutit, Inc.—100

Pneumatic System. Bulletin 1-54. Sprout-Waldron.—102

Drum Lift. Details. Specifications. Fleischman Co.—136

Processing Equipment

Kettles & Tanks. Information. Sarco Co., Inc.—30

Silicone Antifoamers & Defoamers. Sample. Dow Corning Corp.—52

Pail Linings Processing. Samples. Information. Rheem.—105

Valves

Valves. Bulletins PED 259 & PED 260. Chemetron Corp., Girdler Process Equip.—11

Valve, controller, positioner. Bulletin XG-755. Robertshaw-Fulton Controls Co. —17

Valves. Details. Strahman Valves, Inc.—91

Sprockets, taper-lock, and Roller Chain. Bulletin. Dodge Mfg. Co.—109

Valves, Pumps, Fittings. Information. G & H Products Corp.—112

Motors & Transmissions

Heaters. H I-R-Temp Bulletin #4023. Vapor Heating Corp.—71

Refrigeration, Air Conditioning & Compressors

Refrigeration. Information. Surface Combustion—26

USE OF CARDS IS RESTRICTED TO FOOD INDUSTRY MANAGEMENT AND CONSULTANTS

DEC. 1960

Good till Feb. 28, 1961

Name ..... Title .....

Company .....

Address .....

.....

Please send me further information on the items circled below—

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500

Where ads offer more than one item, I've written key number and identity below

.....

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

FIRST CLASS PERMIT No. 36 NEW YORK, N. Y.

BUSINESS REPLY MAIL

POSTAGE WILL BE PAID BY

FOOD Engineering

P. O. BOX 205

VILLAGE STATION

NEW YORK 14, NEW YORK

Dryers. Details. The Heil Co. —92

Refrigeration, no-frost. Bulletin #105. Niagara Blower Co.—98

Controls & Instruments

Displacement Meters. Information. Buffalo Meter Co. —40

Weighing Machines. Form 3311. Exact Weight Scale Co.—54

Scales. Details. Olofsson Corp.—107

Pneumatic Controller. Data. The Bristol Co.—113

Scales. Specifications. Detecto Scales, Inc.—137

Ingredients, Additives, Chem.

Monoglycerides. Samples & information. Eastman Kodak Co.—8

Powdered Flavoring. Data. sheet. Samples. Hercules Powder Co., Inc.—16

Sweetener. Brochure, "New Ingredients for New Food Products." Refined Syrups and Sugars, Inc.—55

Yeast. Sample. Literature. Red Star Yeast & Products Co.—69

Chelating Agent. Information. Samples. Dow Chemical Co.—72

Gelatines. Samples. Tech Bulletins. Kelco Co.—76

Propylene Glycol. Tech. service. Information. Jefferson Chemical Co., Inc.—78

Flavoring, raspberry. Tech data. Samples. Firmenich, Inc.—89

Flavoring, from corn products. Data. Corn Products Co.—95

Distilled Acetylated Monoglycerides. Bulletin A-1. Samples. Eastman Kodak Co., Distillation Products Industries—96

Flavoring. Catalog. R. D. Webb & Co., Inc.—103

Corn Products. Tech. service. Clinton Corn Processing Co.—106

Cellulose Gum. Assistance. Hercules Powder Co., Inc. —111

Apple Resin. Information. Speas Co.—115

Chemicals. Samples. Tech Data. Sheffield Chemical—116

Proteases. Information. Miles Chemical Co.—118

Flavorings. Data. Sunkist Growers—123

Packaging Machinery

Automatic Caser. Information. Food Machinery & Chemical Corp.—6

Bag Maker, Filler, Sealers. Information. Triangle Pack. Mach. Co.—86

Packaging Machinery. Details. Hayssen Mfg. Co.—108

Cap Tightener. Information. Pneumatic Scale Corp., Ltd.—119

Packaging Materials

Cartons, Facts. Standard Oil Co.—18

Cartons. "Ingenuity." Weyerhaeuser Co.—44 & 45

Packaging Materials. Brochure "The Olin Carton Story." Olin Mathieson Corp.—53

Aluminum Foil Packaging. Sample. Ekco-Alcoa Containers, Inc.—114

Construction & Maintenance

Insulated Board. Sample. Booklet #2133. Engineered Products Dept., U. S. Plywood Corp.—75

Sanitation & Cleaning

Disposable Wipers. Sample. Kimberly-Clark Corp.—2

Stainless Steel Lavatory. Details. Catalog. St. John & Co.—120

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

BUSINESS REPLY MAIL

POSTAGE WILL BE PAID BY

FOOD Engineering

P. O. BOX 205

VILLAGE STATION

NEW YORK 14, NEW YORK

Name ..... Title .....

Company .....

Address .....

.....

DEC. 1960

Good till Feb. 28, 1961

Please send me further information on the items circled below—

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500

Where ads offer more than one item, I've written key number and identity below

.....

REPRINTS AVAILABLE

Here is a partial list of stories that have appeared in recent issues of FE which, because of wide reader interest in the subject, have been reprinted.

Address requests to Reprint Editor, FOOD ENGINEERING, Chestnut & 56th Streets, Philadelphia 39, Pa.

Sharper Additive Check, June 1960.

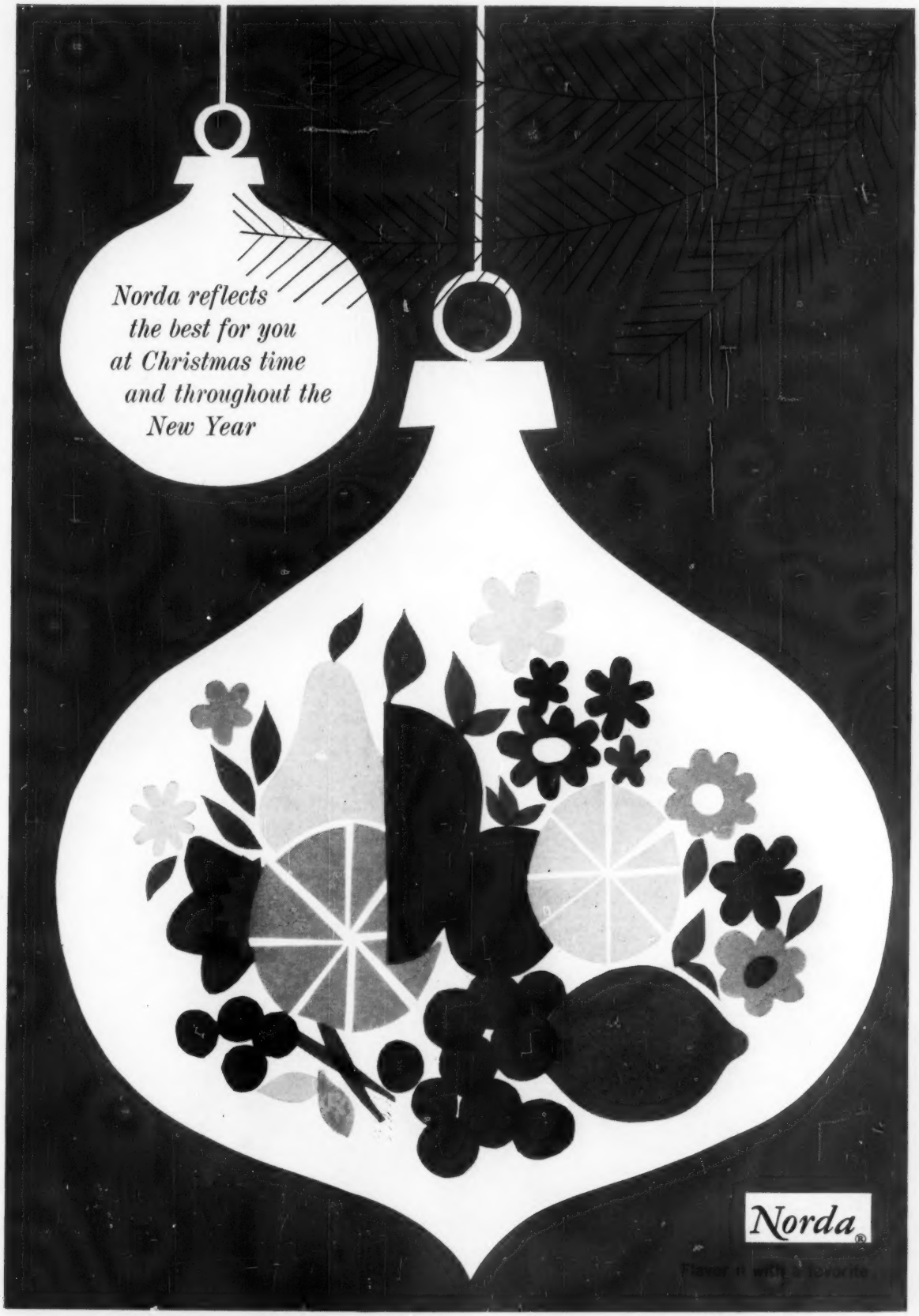
Weighing Makes Big Strides by John V. Ziemba, March 1960.

Broad-Gage Supervisor Training Boosts Selling 5 Ways by T. C. Taylor, September 1958.

Selling Approach: Key to Winning Shelf Space in the Chains by C. R. Havighorst, March 1958.

Putting the Sweet Smell of Success into Sales Promotions by Jerry Keefe, January 1960.

Packaging Check List, July 1957.



CIRCLE 131 ON READER SERVICE CARD

CIRCLE 132 ON READER SERVICE CARD →

WHICH FLAVORS WILL OUTSELL?

Identical flavors to the eye, yes . . . to the taste, no. The basic difference in each case is the unique flavor of one—perfected to outsell—developed by IFF.

Creating outstanding flavors for individual products is an experienced specialty of IFF. The result is a product which establishes brand demand, repeat sales, in a highly competitive market.

And if you are in the international market, IFF can minimize problems of supply. Uniform manufacturing and quality control in all of its plants throughout the world assure customers that IFF flavors, wherever ordered, remain the same from batch to batch.

For the flavors that outsell, contact IFF.

iff

FLAVOR DIVISION

INTERNATIONAL FLAVORS & FRAGRANCES INC.

417 Rosehill Place, Elizabeth 2, N. J.

Leading Creators and Manufacturers in the World of Flavor

ARGENTINA AUSTRIA BELGIUM BRAZIL CANADA ENGLAND FRANCE GERMANY HOLLAND INDONESIA ITALY NORWAY SOUTH AFRICA SWEDEN SWITZERLAND U.S.A.